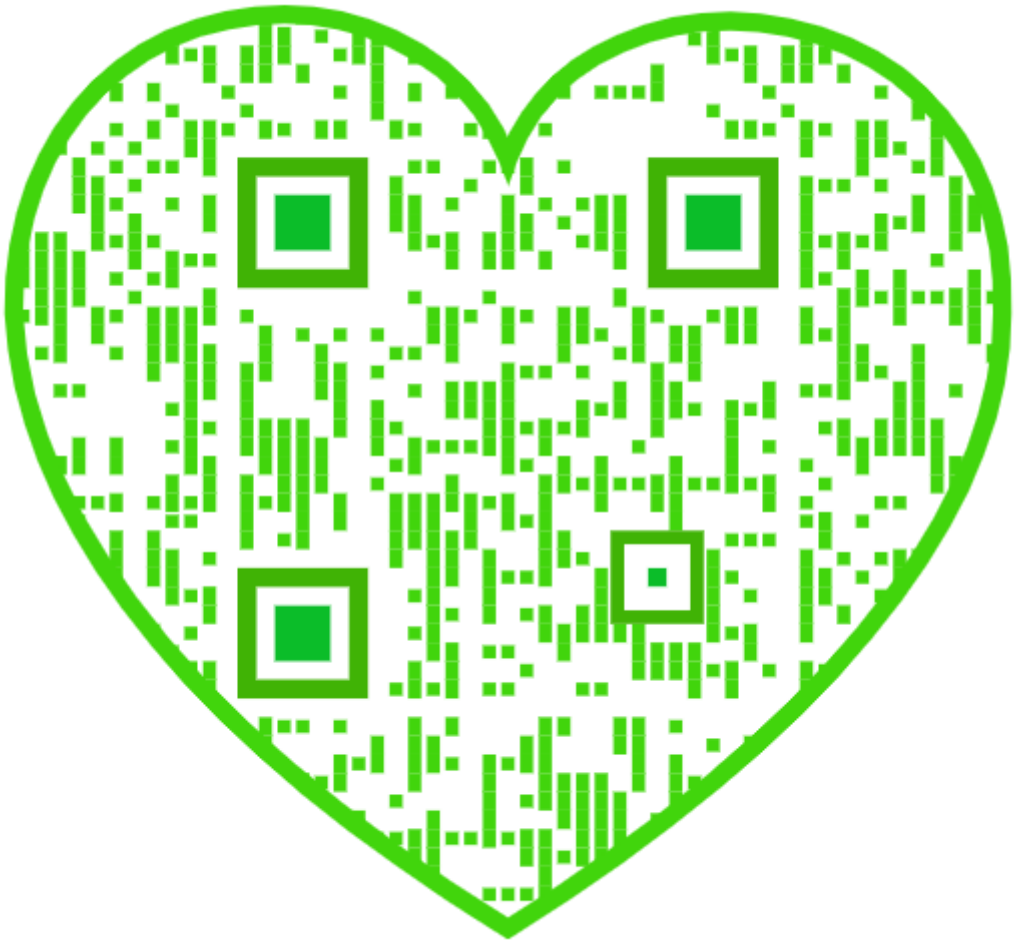

TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

and Abdominal Surgeons

VOL. XXI

FOR THE YEAR 1908

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AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

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NOTE.

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

WILLIAM WARREN POTTER, *Secretary*,
238 Delaware Avenue, Buffalo.

[Minutes and discussions stenographically reported by William Whitford, Chicago, Ill.]

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CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

TOGETHER WITH

MINUTES OF THE TWENTY-FIRST ANNUAL MEETING

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

CONSTITUTION.

I. The name of this Association shall be THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Abdominal Surgery, Obstetrics, and Gynecology.

MEMBERS.

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, and Corresponding Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least one month before the first day of meeting, by two Fellows, and shall be balloted for at the annual meeting, a list of names, having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all the members present shall be necessary to elect—fifteen Fellows at least being in attendance.

All candidates for active fellowship shall submit to the Executive Council, at least one month before the annual meeting, an original paper relating to Abdominal Surgery, Obstetrics, or Gynecology.

HONORARY FELLOWS.

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

CORRESPONDING FELLOWS.

V. The Corresponding Fellows shall be recommended by the Executive Council and elected by the Association.

They shall enjoy all the priveliges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual TRANSACTIONS.

They shall pay an annual fee of five dollars.

OFFICERS.

VI. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and six Executive Councillors.

The nomination of all officers shall be made in open session at the business meeting, and the election shall be by ballot.

The first five officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

["At the election next succeeding the adoption of these laws, the full number of Executive Councillors shall be elected; two for a term of three years, two for a term of two years, and two for a term of one year.

"At every subsequent election two Councillors shall be elected for a term of three years, and shall continue in office until their successors shall have been elected and shall have qualified."][1]

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS.

VII. The time and place of holding the annual meeting shall be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Association.

[1]Amendment adopted September 21, 1898.

AMENDMENTS.

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting: *provided*, that notice of the proposed amendment shall have been given in writing at the annual meeting next preceding: and *provided, further*, that such notice shall have been printed in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

BY-LAWS.

THE PRESIDING OFFICER.

I. The President, or in his absence, one of the Vice-Presidents, shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY.

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the TRANSACTIONS under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

TREASURER.

III. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL.

IV. The Executive Council shall meet as often as the interests of the Association may require. The President, or any three members may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the action of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS.

V. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at 10 o'clock A. M.
   a. Reports of Committees on Scientific Questions.
   b. Reading of Papers and Discussion of the same.
2. One business Meeting shall be held at half-past nine o'clock A. M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's record shall be read; the Treasurer's Accounts submitted; the reports of Committees on other than scientific subjects offered; and all Miscellaneous Business transacted.

PAPERS.

VI. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than thirty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM.

VII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be present.

DECORUM.

VIII. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE.

IX. Each Fellow, on admission, shall pay an initiation fee of twenty-five dollars, which shall include his dues for the first year.

Every Fellow shall pay, *in advance* (*i.e.*, at the beginning of each fiscal year) the sum of twenty dollars annually thereafter.

[A fiscal year includes the period of time between the first day of one annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon vote of the Executive Council.

The Secretary shall receive, annually, a draft from the President, drawn on the Treasurer, for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE.

X. Any Fellow who shall neither attend nor present a paper for three consecutive years, unless he offer a satisfactory excuse, may be dropped from fellowship, upon vote of the Executive Council.

RULES.

XI. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS.

XII. These By-Laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided*, previous notice in writing shall have been given at the annual meeting next preceding the one at which the vote is to be taken.

OFFICERS FOR 1908–1909.

PRESIDENT.

WILLIAM HENRY HUMISTON, Cleveland.

VICE-PRESIDENTS.

JAMES EDGAR SADLIER. Poughkeepsie.
JOHN D. S. DAVIS, Birmingham.

SECRETARY.

WILLIAM WARREN POTTER, Buffalo.

TREASURER.

XAVIER OSWALD WERDER, Pittsburg.

EXECUTIVE COUNCIL.

HUGO OTTO PANTZER, Indianapolis.
RUFUS BARTLETT HALL, Cincinnati.
ROBERT TUTTLE MORRIS, New York.
WILLIAM A. B. SELLMAN, Baltimore.
E. GUSTAV ZINKE, Cincinnati.
HERMAN EMIL HAYD, Buffalo.

HONORARY FELLOWS.

*Deceased.

1899.—Ballantyne, John William, M.D., F.R.C.P.E., F.R.S. Edin. Lecturer on Midwifery and Gynecology, School of the Royal College, Edinburgh; Examiner in Midwifery and Gynecology in the University of Edinburgh; Vice-President of the Edinburgh Obstetrical Society; Honorary Fellow of the Glasgow Obstetrical and Gynecological Society. 24 Melville Street, Edinburgh, Scotland.

1889.—Bantock, George Granville, M.D., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. 36 Gloucester Place, Portman Square, W.; Dunrobin, Payne's Lane, Pinner, Middlesex, London, W., England.

1889.—Barbour, Sir A. H. Freeland, M.A., B.S.C., M.D., F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies, and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1892.—*Boisliniere, L. Ch., A.B., M.D., LL.D. Saint Louis, Mo. 1896.

1890.—Championniere, Just. Lucas, M.D. 3 Avenue Montaigne, Paris, France.

1889.—*Charpentier, Louis Arthur Alphonse, M.D. Paris, France. 1899.

1888.—Cordes, August Elisee, M.D. Member of the Royal College of Physicians, London; Fellow of the Obstetrical Society of London and of the British Gynecological Society; Corresponding National Member of the Obstetrical and Gynecological Society of Paris; Honorary Fellow of the Detroit Gynecologi-

cal Society; late "Chirurgien-adjoint" of the Obstetrical and Gynecological Clinic at the Maternity at Geneva; Consulting Accoucheur of the Miséricorde Hospital, etc.; Perpetual member of the Société Obstétricale de France, Paris, France. 3 Chemin du Square, Geneva, Switzerland.

1890.—*Corson Hiram, M.D. Plymouth Meeting, Pa. 1896.

1889.—Croom, Sir J. Halliday, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Physician to and Clinical Lecturer on Diseases of Women, Royal Infirmary, Edinburgh; Physician to the Royal Maternity Hospital; Lecturer on Midwifery and the Diseases of Women at the School of Medicine; Consulting Physician for Diseases of Women, Western Dispensary. 25 Charlotte Square, Edinburgh, Scotland.

1889.—*Dunlap, Alexander, A. M., M.D. Springfield, O. 1894.

1888.—*Edis, Arthur Wellesley, M.D. Lond. F.R.C.S., M.R.S.C.S. London, England. 1893.

1889.—*Eklund, Abraham Fredrik, M.D. Stockholm, Sweden. 1898.

1891.—Fernandez, Juan Santos, M.D. Prado, No. 105, Havana, Cuba.

1891.—*Fisher, George Jackson, A.M., M.D. Sing Sing, N. Y. 1893.

1889.—Freund, William Alexander, M.D. Emeritus Professor and Director of the Clinic for Diseases of Women in the University of Strassburg. Kleiststrasse 9, Berlin W., Germany.

1896.—*Gaston, James McFadden, A.M., M.D. Atlanta, Ga. 1903.

1892.—*Green, Traill, M.D., LL.D. Easton, Pa. 1897.

1894.—Jacobs, Charles, M.D. Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Honorary President of the Belgian Society of Gynecology and Obstetrics; Honorary Fellow of the Gynecological Societies of New York and Chicago; Member of the Southern Surgical and Gynecological Association; Correspond-

ing Member of the Gynecological Society of Paris; Surgeon to the Brussels Polyclinic. 53 Boulevard de Waterloo, Brussels, Belgium.

1889.—*Keith, Thomas, M.D. London, England. 1896.

1889.—Leopold, G., M.D. Professor in the Royal Clinic for Diseases of Women. 90 Pfotenhauerstrasse, Dresden, Germany.

1905.—McGraw, Theodore A., M.D. 73 Cass Street, Detroit, Mich.

1894.—*Maclean, Donald, M.D. Detroit, Mich. 1903.

1890. Martin, August, M.D. Emeritus Professor of Gynecology in the University of Greifswald. Keithstrasse 14, Berlin W. 62, Germany.

1895.—*Mastin, Claudius Henry, M.D., LL.D. Mobile, Ala. 1898.

1897.—Mathews, Joseph McDowell, M.D. Professor of Diseases of the Rectum and Clinical Surgery, Hospital College of Medicine; President of the Kentucky State Board of Health; First Vice-President American Medical Association, 1898; President, 1899. 411 The Masonic, Louisville, Kentucky.

1891.—*Moses, Gratz Ashe, M.D. Saint Louis, Mo. 1901.

1905.—*Myers, William Herschel, M.D. (*Founder.* Transferred from Ordinary List.) Fort Wayne, Ind. 1907.

1889.—Nicolaysen, Julius, M.D. Professor of Surgery in the University of Norway. Christiania, Norway.

1891.—Pietranera, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1889.—*Saenger, Max, M.D. Prague. 1903.

1890.—*Savage, Thomas, M.D., F.R.C.S. Eng. Birmingham, England. 1907.

1889.—Schultze, Bernhard Sigmund, M.D. Professor of Gynecology; Director of the Lying-in Institute and of the Gynecological Clinic. 2 Sellierstrasse, Jena, Germany.

1890.—SEGOND, PAUL, M.D. Professor of Clinical Surgery of the Faculty of Medicine, Paris; Surgeon to the Salpétrière. 4 Quai Debilly, Paris, France.

1899.—SINCLAIR, SIR WILLIAM JAPP, M.A., M.D. (Aberd.), M.R.C.P. Professor of Obstetrics and Gynecology, Owens College, Victoria University; Physician to the Manchester Southern Hospital for Diseases of Women and Children. Garvock House, Dudley Road, Whalley Range, Manchester, England.

1894.—*SLAVIANSKY, KRONID, M.D. St. Petersburg, Russia. 1898.

1888.—*SMITH, J. GREIG, M.A., C.M., M.B., F.R.S.E. Bristol, England. 1897.

1896.—STERNBERG, GEORGE MILLER, A.M., M.D., LL.D. Surgeon-General U. S. Army (Retired). 2005 Massachusetts Avenue, Washington, D.C.

1899.—*STORRS, MELANCTHON, A.M., M.D. (*Founder.* Transferred from Ordinary List.) Hartford, Conn. 1900.

1888.—*Tait, LAWSON, M.D., LL.D., F.R.C.S.E. Birmingham, England. 1899.

1905.—TAYLOR, WILLIAM HENRY, M.D. *President*, 1888–1889. (*Founder.* Transferred from Ordinary List.) 553 West Seventh Street, Cincinnati, Ohio.

1900.—*THORNTON, J. KNOWSLEY, M.B., M.C. Cambridge, England. 1904.

1888.—WILLIAMS, SIR JOHN, BART., M.D., F.R.C.P. Plâs Llanstephan, Carmarthenshire, Wales.

1901.—WEBER, GUSTAV C. E., M.D., LL.D. Willoughby, Ohio.

1889.—VON WINCKEL, F., M.D. Professor of Gynecology and Director of the Royal Hospital for Women; Member of the Supreme Council and of the Faculty of Medicine in the University of Munich. 16A Sonnenstrasse, Munich, Germany.

1905.—WYMAN, WALTER, M.D. Surgeon General United States Public Health and Marine Hospital Service. Stoneleigh Court, Washington, D.C.

Total, twenty-four Honorary Fellows.

CORRESPONDING FELLOWS.

1899.—Beuttner, Oscar, M.D. Privat-docent of the Faculty of Medicine. 2 Place de la Fasterie, Geneva, Switzerland.

1903.—Crozel, G., M.D. Professor Libre of Gynecology. Collonges au Mont d'Or (Rhone), France.

1903.—Ellis, Guilherme, M.D. Chief Surgeon to the Real Sociedade de Beneficencia Portuguese Hospital. 6 Rua Aurora, S. Paulo, Brazil, S. A.

1891.—Griffin, Herbert Spohn, B.A., M.D. Surgeon to Hamilton City Hospital; Examiner in Obstetrics, University of Toronto. 157 Main Street, Hamilton, Ontario, Canada.

1903.—Lane, Horace Manley, M.D., LL.D. President of Mackenzie College, S. Paulo, Brazil. 184 Rua da Consolacao, S. Paulo, Brazil, S. A.

1891.—Machell, Henry Thomas, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Women's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

1898.—Wright, Adam Henry, B.A., M.D. Univ. Toronto, M.R.C.S., Eng.; Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital, *President*, 1891. (Transferred from Ordinary List, 1898.) 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, seven Corresponding Fellows.

ORDINARY FELLOWS.

*Deceased. †Resigned.

1902.—Abrams, Edward Thomas, A.M., M.D. Consulting Surgeon to the Lake Superior General Hospital; Member of the Michigan State Medical Society; Member of the American Medical Association. Dollar Bay, Mich.

1890.—Asdale, William James, M.D. Professor of Diseases of Women, Western Pennsylvania Medical College (Medical Department, University of Western Pennsylvania), Pittsburg, Pa. Patterson Heights. Beaver Falls, Pa.

1895.—Bacon, Joseph Barnes, M.D. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University, Chicago. Macomb, Ill.

Founder.—*Baker, Washington Hopkins, M.D. Philadelphia, Pa. 1904.

1895.—Baldwin, James Fairchild, A.M., M.D. Surgeon to Grant Hospital, 125 South Grant Avenue. Residence, 405 E. Town Street, Columbus, Ohio.

1903.—Bandler, Samuel Wyllis, M.D. Instructor in Gynecology in the New York Post-Graduate Medical School and Hospital; Adjunct Gynecologist to the Beth Israel Hospital. 134 West Eighty-seventh Street, New York, N.Y.

1889.—†Barrow, David, M.D. Lexington, Ky. 1907.

1907.—Bell, John Norval, M.D. Adjunct Professor of Obstetrics and Gynecology at Detroit College of Medicine; Gynecologist to Harper Hospital Polyclinic. Residence, 418 Fourth Avenue; Office, 506 Washington Arcade, Detroit, Mich.

1892.—Blume, Frederick, M.D. Gynecologist to the Allegheny General Hospital and Pittsburg Free Dispensary; Obstetrician to the Roselia Maternity Hospital; Consulting Gynecolo-

gist to the Mercy Hospital; President of the Pittsburg Obstetrical Society, 1892. 524 Penn. Avenue, Pittsburg, Pa.

1900.—Bonifield, Charles Lybrand, M.D. Professor of Clinical Gynecology in the Medical College of Ohio; President of the Cincinnati Academy of Medicine, 1900; Gynecologist to the Good Samaritan, Christ's, and to Speer's Memorial Hospitals; formerly President of the Cincinnati Obstetrical Society; Secretary of the Section on Obstetrics and Gynecology, American Medical Association, 1901–4; Chairman, 1905; *Vice-president*, 1907. Residence, corner Washington and Gholson Avenues; Office, 409 Broadway, Cincinnati, Ohio.

1896.—Bosher, Lewis C., M.D. Professor of Practice of Surgery and Clinical Surgery, Medical College of Virginia; Visiting Surgeon, Memorial Hospital, Richmond. 422 East Franklin Street, Richmond, Va.

Founder.—Boyd, James Peter, A.M., M.D. Professor of Obstetrics, Gynecology and Diseases of Children in the Albany Medical College; Gynecologist to the Albany Hospital; Consulting Obstetric Surgeon to St. Peter's Hospital; Fellow of the British Gynecological Society. 152 Washington Avenue, Albany, N. Y.

1889.—Branham, Joseph H., M.D. Professor of Surgery in the Maryland Medical College; Surgeon to the Franklin Square Hospital. 2200 Eutaw Place, corner Ninth Avenue, Baltimore, Md.

1894.—Brown, John Young, M.D. Professor of Clinical Surgery in Saint Louis University; Chief Surgeon to St. John's Hospital; President of the Mississippi Valley Medical Association, 1898; *Vice-president*, 1905; *President*, 1906; *Executive Council*, 1907–8. Residence, 303 North Grand Avenue; Office, 612 Metropolitan Building, Saint Louis, Mo.

1889.—*Burns, Bernard, M.D. Allegheny, Pa. 1892.

1908.—Buteau, Samuel H., M.D. Former member of California State Board of Medical Examiners; formerly Visiting Surgeon to Almeda County Hospital. Residence, 1052 Telegraph Avenue; Office, 1155 Broadway, Oakland, Cal.

1906.—Cannady, John Egerton, M.D. Former Surgeon in Chief of Sheltering Arms Hospital, Hansford, W. Va.; Surgeon

to the Charleston General Hospital; Surgeon to McMillan's Hospital, Charleston; Fellow of the Southern Surgical and Gynecological Association; Non-resident Honorary Fellow of the Kentucky State Medical Association; Fellow West Virginia Medical Association, Virginia Medical Society, American Medical Association, Tri-State Society Virginia and the Carolinas, American Association of Railway Surgeons. Office, Coyle and Richardson Building, Charleston, W. Va.

Founder.—CARSTENS, J. HENRY, M.D. Professor of Obstetrics and Clinical Gynecology in the Detroit College of Medicine; Gynecologist to the Harper Hospital; Attending Physician to the Woman's Hospital; Obstetrician to the House of Providence; President of the Detroit Gynecological Society, 1892. *Vice-president*, 1888–89; *President*, 1895; *Executive Council*, 1896–98. 620 Woodward Avenue, Detroit, Mich.

1895.—CHASE, WALTER BENAJAH, M.D. Gynecologist to the Bushwick Hospital; Attending Surgeon and Gynecologist, Central Hospital and Dispensary; Consulting Gynecologist to the Long Island College Hospital; Councilor to the Long Island College Hospital; Fellow of the Brooklyn Gynecological Society (President, 1893); Member Medical Society County of Kings (President, 1892); Permanent Member Medical Society State of New York; Member of the Brooklyn Pathological Society, and Honorary Member of the Queens Country Medical Society. *Executive Council*, 1899–1904. 1055 Park Place, Borough of Brooklyn, New York.

Founder.—†CLARKE, AUGUSTUS PECK, A.M., M.D. Cambridge, Mass. 1908.

1890.—*COLES, WALTER, M.D. Saint Louis, Mo. 1892.

1904.—CONGDON, CHARLES ELLSWORTH, M.D. Gynecologist to the City Hospital for Women. Office, 859 Humboldt Parkway. Residence, The Markeen, Buffalo, N. Y.

1906.—CRAIG, DANIEL HIRAM, M.D. Surgeon to Out Patients, Free Hospital for Women; Instructor in Gynecology in the Boston Polyclinic. 386 Commonwealth Avenue, Boston, Mass.

1901.—CRILE, GEORGE W., A.M., M.D. Professor of Clinical Surgery in the Western Reserve University Medical College; Surgeon to St. Alexis's Hospital; Associate Surgeon to Lake-

side Hospital. *Vice-president*, 1907. Residence, 1021 Prospect Avenue; Office, Osborn Building, Cleveland, Ohio.

1894.—†Crofford, Thomas Jefferson, M.D. Memphis, Tenn. 1909.

1905.—Crossen, Harry Sturgeon, M.D. Clinical Professor of Gynecology in Washington University; Gynecologist to Washington University Hospital; Associate Gynecologist to Mullanphy Hospital; Consulting Gynecologist to Bethesda, City and Female Hospitals. 4477 Delmar Avenue, Saint Louis, Mo.

1897.—Cumston, Charles Greene, B.M.S., M.D. (Geneva, Switzerland.) Assistant Professor of Surgical Pathology, Tufts College Medical School, Boston; Member of the Massachusetts Medical Society; Honorary Member of the Surgical Society of Belgium, and Corresponding Member of the Obstetrical and Gynecological Society of Paris; Corresponding Member of the Association of Genitourinary Surgeons of France; Corresponding Member of the Pathological Society of Brussels, Belgium; Corresponding Member of the Electrotherapeutical Society of France. *Vice-president*, 1902. 871 Beacon Street, Boston, Mass.

Founder.—†*Cushing, Clinton, M.D. San Francisco, Cal. 1900. 1904.

1903.—Davis, John D.S., M.D. Professor of Surgery in the Birmingham Medical College; Surgeon to Hillman Hospital; ex-President of Jefferson County Medical Society and of the Board of Health of Jefferson County. *Vice-president*, 1909. 2031 Avenue G., Birmingham, Ala.

1889.—*Davis, William Elias B., M.D. Birmingham, Ala. 1903.

1902.—Deaver, Harry Clay, M.D. Visiting Surgeon to the Episcopal, St. Christopher's, and St. Mary's Hospitals. 1534 North Fifteenth Street, Philadelphia, Pa.

1896.—Deaver, John Blair, M.D. Formerly Assistant Professor of Applied Anatomy at the University of Pennsylvania; Visiting Surgeon to the German Hospital. 1634 Walnut Street, Philadelphia, Pa.

1892.—Dorsett, Walter Blackburn, M.D. Professor of Obstetrics and Gynecology in the Marion Sims-Beaumont Col-

lege of Medicine, Medical Department of Saint Louis University; Gynecologist to the Missouri Baptist Sanitarium, Evangelical Deaconess's Hospital and the Good Samaritan Hospitals; Consulting Gynecologist to the Saint Louis City and Female Hospitals. President of the Saint Louis Medical Society, 1892; President of the Missouri State Medical Society, 1900; Chairman of the Section on Obstetrics and Gynecology, American Medical Association, 1907. *Vice-president*, 1898; *President*, 1904; *Executive Council*, 1905–1907. Residence, 5070 Washington Avenue; Office, Linmar Building, corner Washington and Vandeventer Avenues, Saint Louis, Mo.

1889.—†*Douglas, Richard, M.D. Nashville, Tenn. 1905. 1907.

1892.—*Duff, John Milton, A.M., M.D., Ph.D. Pittsburg, Pa. 1904.

1898.—*Dunn, James C., M.D. Pittsburg, Pa. 1907.

1892.—*Dunning, Lehman Herbert, M.D. Indianapolis, Ind. 1906.

1899.—Eastman, Thomas Barker, A.B., M.D. Professor of the Medical and Surgical Diseases of Women, Central College of Physicians and Surgeons; Gynecologist to the City Hospital, City Dispensary, and Central Free Dispensary. 331 North Delaware Street, Indianapolis, Ind.

1904.—Elbrecht, Oscar H., M.D. Superintendent and Surgeon in charge of the Saint Louis Female Hospital. 5600 Arsenal Street, Saint Louis, Mo.

1906.—Erdmann, John Frederick, M.D. Clinical Professor of Surgery in University-Bellevue Hospital Medical College; Surgeon to Gouverneur, St. Mark's, and Sydenham Hospitals. 60 West Fifty-second Street, New York, N. Y.

1895.—Ferguson, Alexander Hugh, M.D. Professor of Surgery at the Chicago Post-Graduate Medical School. Residence, 4619 Grand Boulevard; Office, Suite 300, Reliance Building, 100 State Street, Chicago, Ill.

1903.—Frank, Louis, M.D. Professor of Abdominal and Pelvic Surgery in the Medical Department of Kentucky University; Surgeon to Louisville City Hospital; Surgeon and Gyne-

cologist to the Broadway Infirmary. Residence, 1415 Fourth Avenue; Office, The Atherton, Louisville, Ky.

1890.—Frederick, Carlton Cassius, B.S., M.D. Clinical Professor of Gynecology in the Medical Department of Buffalo University; Obstetrician and Gynecologist to the Buffalo Woman's Hospital; Obstetrician to the Widows' and Infants' Asylum; Gynecologist to the Erie County Hospital. 64 Richmond Avenue, Buffalo, N. Y.

1891.—Gibbons, Henry, Jr., A.M., M.D. Dean and Professor of Obstetrics and Diseases of Women and Children in Cooper Medical College; Consulting Physician to the French and the Children's Hospitals. 2405 Fillmore Street, San Francisco, Cal.

1902.—Gillette, William J., M.D. Professor of Abdominal Surgery and Gynecology in the Toledo Medical College; Surgeon to Robinwood Hospital. 1613 Jefferson Street, Toledo, Ohio.

1895.—Goldspohn, Albert, M.D. Professor of Gynecology, Post-Graduate Medical School; Senior Gynecologist, German Hospital; Attending Gynecologist; Post-Graduate and Charity Hospitals. *Vice-president*, 1901. Residence, 519 Cleveland Avenue; Office, 34 Washington Street, Chicago, Ill.

1904.—Goodfellow, George E., M.D. Division Surgeon San Francisco Railroad. Care of R.W. Kenny, 308 South Broadway, Los Angeles, Cal.

1903.—Guenther, Emil Ernest, M.D. Senior Assistant Gynecologist and Obstetrician to St. Barnabas's Hospital; Attending Surgeon to the German Hospital, Newark. 159 West Kinney Street, Newark, N. J.

1907.—Guiteras, Ramon, M.D. Visiting Gynecologist to the City Hospital; Visiting Surgeon to Columbus Hospital; Consulting Surgeon to the French Hospital; Professor of Genitourinary Surgery at the Post-Graduate Medical School and Hospital, New York. 75 West 55th Street, New York, N. Y.

1892.—*Haggard, William David, M.D. Nashville, Tenn. 1901.

1900.—Haggard, William David, Jr., M.D. Professor of Gynecology, Medical Department University of Tennessee; Pro-

fessor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to the Nashville City Hospital; President of the Nashville Academy of Medicine; Secretary of the Section on Diseases of Women and Obstetrics, American Medical Association, 1898; Fellow (and Secretary) of the Southern Surgical and Gynecological Association; Member of the Alumni Association of the Woman's Hospital, N. Y. *Vice-president*, 1904. 148 Eighth Avenue, North, Nashville, Tenn.

1906.—Hall, Joseph Arda, M.D. Clinical Assistant in Gynecology at the Miami Medical College. Cincinnati. 628 Elm Street, Cincinnati, Ohio.

1889.—Hall, Rufus Bartlett, A.M., M.D. Professor of Gynecology and Clinical Gynecology at the Miami Medical College; Gynecologist to the Presbyterian Hospital; Member of the British Gynecological Association; of the Southern Surgical and Gynecological Association; of the American Medical Association; of the Ohio State Medical Society (President, 1900); of the Cincinnati Academy of Medicine; President of the Cincinnati Obstetrical Society, 1896. *Vice-president*, 1891; *President*, 1900; *Executive Council*, 1904–1909. Berkshire Building, 628 Elm Street, Cincinnati, Ohio.

1902.—Hamilton, Charles Sumner, A.B., M.D. Professor of the Principles of Surgery in Sterling Medical College; Surgeon to Mt. Carmel and the Children's Hospitals. 1 North Fourth Street, Columbus, Ohio.

1894.—Hayd, Herman Emil, M.D., M.R.C.S. Eng. Gynecologist to the Erie County Hospital; Surgeon to the German Hospital. *Vice-president*, 1903; *Executive Council*, 1908–1909. 493 Delaware Avenue, Buffalo, N. Y.

1908.—Hedges, Ellis W., A.B., M.D. Visiting Surgeon to Muhlenberg Hospital, Plainfield, N. J. 703 Watchung Avenue, Plainfield, N. J.

Founder.—*Hill, Hampton Eugene, M.D. Saco, Me. 1894.

1891.—Holmes, Josus Billington Sanders, M.D. Professor of Obstetrics in the Southern Medical College; President of the Georgia State Medical Association, 1890; Member of the Southern Surgical and Gynecological Association; Member of the American Medical Association. Valdosta, Ga.

1891.—Howitt, Henry, M.D., M.R.C.S. Eng. Surgeon to the Guelph General and St. Joseph's Hospital, Guelph; Member of the British and Ontario Medical Associations; Medical Health Officer for the City of Guelph. *Vice-president*, 1895. 235 Woolwich Street, Guelph, Ontario, Canada.

1905.—Huggins, Raleigh Russell, M.D. Surgeon to St. Francis Hospital. Diamond Building, Fifth Avenue and Liberty Street, Pittsburg, Pa.

1895.—Humiston, William Henry, M.D. Associate Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist in Chief to St. Vincent's Charity Hospital; Consulting Gynecologist to the City Hospital; President of the Ohio State Medical Society, 1898. *Executive Council:* 1902–1903, 1908. *President*, 1909. Residence, 2041 East Eighty-ninth Street; Office, 536 Rose Building, Cleveland, Ohio.

1898.—*Hyde, Joel W., M.D. Brooklyn, N. Y. 1907.

1901.—Ill, Charles L., M.D. Surgeon to German Hospital; Assistant Gynecologist to St. Michael's and St. Barnabas's Hospitals; Obstetrician to St. Barnabas's Hospital, Newark; Assistant Gynecologist to All Souls' Hospital, Morristown. 188 Clinton Avenue, Newark, N. J.

Founder.—Ill, Edward Joseph, M.D. Surgeon to the Woman's Hospital; Medical Director of St. Michael's Hospital; Gynecologist and Supervising Obstetrician to St. Barnabas's Hospital; Consulting Gynecologist to the German Hospital and the Bnoth Israel Hospital of Newark, N. J., to All Souls' Hospital, Morristown, N. J., and to the Mountain Side Hospital, Montclair, N. J.; Member of the Southern Surgical and Gynecological Association; Vice-president from New Jersey of the Pan-American Medical Congress of 1893; President of the Medical Society of the State of New Jersey, 1907. *Vice-president*, 1893; *President*, 1899; *Executive Council*, 1901–1903. 1002 Broad Street, Newark, N. J.

1897.—*Ingraham, Henry Downer, M.D. Buffalo, N. Y. 1904.

Founder.—*Jarvis, George Cyprian, M.D. Hartford, Conn. 1900.

1894.—†Jayne, Walter Addison, M.D. Denver, Col. 1908.

1892.—*Jelks, James Thomas, M.D. Hot Springs, Ark. 1902.

1891.—Johnston, George Ben, M.D. Professor of Gynecology and Abdominal Surgery in the Medical College of Virginia; Surgeon to the Old Dominion Hospital; Physician to St. Joseph's Female Orphan Asylum; Consulting Surgeon to the City Free Dispensary; Member of the American Surgical Association (President, 1905); Vice-president of the Southern Surgical and Gynecological Association, 1892 (President, 1897); ex-President of the Richmond Medical and Surgical Society; President of the Virginia State Medical Society, 1897. *Vice-president*, 1897. 407 East Grace Street, Richmond, Va.

1906.—Jonas, Ernst, M.D. Gynecologist to the Saint Louis Jewish Hospital; Surgeon to the Martha Parsons Free Hospital for Children; Instructor in Surgery and Associate Chief in the Surgical Clinic at the Washington University Hospital. 4474 Westminster Place, Saint Louis, Mo.

1902.—Keefe, John William, M.D. Attending Surgeon to the Gynecological Department of St. Joseph's Hospital; Attending Surgeon to the Rhode Island Hospital; Consulting Surgeon to the Providence Lying-in Hospital. *Vice-president*, 1908. 259 Benefit Street, Providence, R. I.

1908.—Kirchner, Walter C. G., A.B., M.D. Superintendent and Surgeon in charge of the Saint Louis City Hospital. Residence, City Hospital, 14th and Lafayette Streets, St. Louis, Mo.

1898.—Langfitt, William Sterling, M.D. Surgeon in chief to St. John's Hospital. 608 Fulton Building, Sixth Street and Duquesne Way, Pittsburg, Pa.

1901.—Lincoln, Walter Rodman, B.A., M.D. Lecturer on Gynecology, College of Physicians and Surgeons of Cleveland. Lennox Building, corner Erie Street and Euclid Avenue, Cleveland, Ohio.

1900.—Linville, Montgomery, A.B., M.D. Surgeon to Slemango Valley Hospital; Surgeon to three lines of Pennsylvania Railways. 35 North Mercer Street, New Castle, Pa.

1890.—Longyear, Howard Williams, M.D. Gynecologist to Harper Hospital; Physician to the Woman's Hospital; President of the Detroit Gynecological Society, 1889; Chairman of the

Section on Obstetrics and Gynecology of the Michigan State Medical Society, 1892. *Vice-president*, 1893; *President*, 1905; *Executive Council*, 1906–1908. 271 Woodward Avenue, Detroit, Mich.

Founder.—*Lothrop, Thomas, M.D. Buffalo, N. Y. 1902.

1896.—Lyons, John Alexander, M.D. Instructor in Gynecology at the Post-Graduate Medical School; Gynecologist and Lecturer to Nurses at the Chicago Hospital. 4118 State Street, Chicago, Ill.

1891.—*McCann, James, M.D. Pittsburg, Pa. 1893.

1898.—*McCann, Thomas, M.D. Pittsburg, Pa. 1903.

Founder.—McMurtry, Lewis Samuel, A.M., M.D., LL.D. Professor of Gynecology in the Hospital College of Medicine; Gynecologist to Sts. Mary and Elizabeth Hospital; Fellow of the Edinburgh Obstetrical Society; Fellow of the British Gynecological Society; Corresponding Member of the Obstetrical Society of Philadelphia and of the Gynecological Society of Boston; Member (President, 1891) of the Southern Surgical and Gynecological Association; President American Medical Association, 1905. *Executive Council*, 1891–1892, 1895–1905; *President*, 1893. Suite 542, The Atherton, Louisville, Ky.

Founder.—Manton, Walter Porter, M.D. Professor of Clinical Gynecology and Adjunct Professor of Obstetrics, Detroit College of Medicine; Gynecologist to Harper Hospital and the Eastern Michigan Asylum for the Insane; Vice-president of Medical Board of the Woman's Hospital and Foundling's Home; Consulting Gynecologist to the Northern Michigan Asylum and St. Joseph's Retreat; Gynecic Surgeon to the House of the Good Shepherd; President of the Detroit Academy of Medicine, 1892–1894; President of the Detroit Gynecological Society, 1890; Fellow of the British Gynecological Society; Fellow of the Royal Microscopical Society and of the Zoological Society of London. *Vice-President*, 1894. 32 Adams Avenue, W., Detroit, Mich.

Founder.—†*Maxwell, Thomas Jefferson, M.D. Keokuk, Iowa. 1902. 1905.

Founder.—Miller, Aaron Benjamin, M.D. Professor of Gynecology in the Medical Department of Syracuse University;

Gynecologist to St. Joseph's Hospital, House of the Good Shepherd and Dispensary. *Vice-president*, 1899; 1904. 326 Montgomery Street, Syracuse, N. Y.

1905.—Miller, John D., M.D. Assistant to the Chair of Clinical Gynecology in the Medical College of Ohio, University of Cincinnati. 172 W. McMillan Street, Cincinnati, Ohio.

1896.—*Mooney, Fletcher D., M.D. Saint Louis, Mo. 1897.

1907.—Moriarta, Douglas C., M.D. Senior Surgeon to Saratoga Hospital; Surgeon in chief to Saint Christian Hospital for Children; Director of State Experimental Station at Saratoga. 511 Broadway, Saratoga Springs, N. Y.

1904.—Morris, Lewis Coleman, M.D. Professor of Gynecology and Abdominal Surgery in the Birmingham Medical College; Secretary, Medical Association State of Alabama, 1904; Member of Jefferson County Board of Health. 714 North Eighteenth Street, Birmingham, Ala.

1890.—Morris, Robert Tuttle, A.M., M.D. Professor of Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1892; *Executive Council*, 1906, 1908–1909; *President*, 1907. 616 Madison Avenue, New York, N. Y.

Founder.—*Moses, Gratz Ashe, M.D. Saint Louis, Mo. 1901. (See Honorary Fellows.)

1904.—Murphy, John Benjamin, A.M., M.D. Professor of Surgery and Head of Department North Western University; Chief Surgeon to Mercy Hospital and St. Joseph's Hospital; Attending Surgeon to Wesley Hospital and Columbus Hospital; Consulting Surgeon to Alexian Brothers', Cook County Hospitals, etc. Residence, 3305 Michigan Avenue; Office, 400 Reliance Building, 100 State Street, Chicago, Ill.

Founder.—†*Myers, William Herschel, M.D. Fort Wayne, Ind. 1904. 1907. (See Honorary Fellows.)

1904.—Newman, Louis Edward, A.M., M.D. President of the Saint Louis Obstetrical and Gynecological Society, 1904. 5381 Waterman Avenue, Saint Louis, Mo.

1897.—Nichols, William R., M.D. 295 Edmunton Street, Winnipeg, Manitoba, Canada.

1896.—NOBLE, GEORGE HENRY, M.D. Gynecologist to the Grady Hospital; Secretary to the Section on Obstetrics and Gynecology of American Medical Association, 1897; Member of the Southern Surgical and Gynecological Association. 131 and 133 South Pryor Street, Atlanta, Ga.

1903.—NOBLE, THOMAS BENJAMIN, M.D. Professor of Abdominal Surgery in the Central College of Physicians and Surgeons; Consultant in the Diseases of Women at the City Hospital, City Dispensary, and Protestant Deaconess's Hospital, Indianapolis. 427 Newton Claypool Building, Indianapolis, Ind.

1907.—OLMSTED, INGERSOLL, M.D. Surgeon to the City and St. Joseph's Hospitals, Hamilton, Ont. 215 South James St., Hamilton, Ontario, Canada.

1889.—†PAINE, JOHN FANNIN YOUNG, M.D. Galveston, Texas. 1904.

1899.—PANTZER, HUGO OTTO, M.D. Professor of Clinical Gynecology in the Indiana Medical College, Medical Department of Purdue University; Gynecologist to City Hospital, City Dispensary, St. Vincent's and Deaconess's Hospitals; Member of Indianapolis, Indiana State, Ohio Valley, Mississippi Valley, Medical Associations and Indianapolis Gynecological Association. *Executive Council*, 1907–1909. 224 North Meridian Street, Indianapolis, Ind.

1890.—PEARSON, WILLIAM LIBBY, M.D. 713 Union Street, Schenectady, N. Y.

1899.—PFAFF, ORANGE G., M.D. Adjunct Professor of Obstetrics and Diseases of Women in the Medical College of Indiana; Gynecologist to the City, Deaconess's, and St. Vincent's Hospitals. 1337 North Pennsylvania Street, Indianapolis, Ind.

1898.—PORTER, MILES F., M.D. Professor of Surgery in the Indiana Medical College, Medical Department of Purdue University; Surgeon to Hope Hospital; ex-President Indiana State Medical Society. *Vice-president*, 1902. 207 West Wayne Street, Fort Wayne, Ind.

Founder.—POTTER, WILLIAM WARREN, M.D. Consulting Gynecologist to the Woman's Hospital; Consulting Surgeon to the Buffalo General Hospital; President and Examiner in Obstetrics and Gynecology, New York State Board of Medical Exami-

ners; Chairman of Section of Obstetrics and Diseases of Women, American Medical Association, 1890; President of the Buffalo Obstetrical Society, 1884–1886; Member of the Southern Surgical and Gynecological Association; President of the Medical Society of the State of New York, 1891; Executive President of the Section of Gynecology and Abdominal Surgery, First Pan-American Medical Congress (1893). *Secretary*, 1888–1909. 238 Delaware Avenue, Buffalo, N. Y.

1903.—POUCHER, JOHN WILSON, M.D. Consulting Surgeon to Vassar Brothers Hospital, Poughkeepsie. 339 Mill Street, Poughkeepsie, N. Y.

Founder.—PRICE, JOSEPH, M.D. Physician in charge of the Obstetrical and Gynecological Department of the Philadelphia Dispensary; Member of the Southern Surgical and Gynecological Association; Honorary Fellow of the Medical Society of the State of New York; Honorary Fellow of the South Carolina Medical Society; Honorary Fellow of the Virginia Medical Society; Member of the British Gynecological Association and of the Edinburgh Obstetrical Society. *Executive Council*, 1894–1895; *President*, 1896. 241 North Eighteenth Street, Philadelphia, Pa.

1904.—REDER, FRANCIS, M.D. Chief of Clinic, Department of Rectal Diseases, Medical Department of Washington University; Surgeon to Burlington Rink. 4629 Cook Avenue, Saint Louis, Mo.

Founder.—REED, CHARLES ALFRED LEE, A.M., M.D. Professor of Gynecology and Abdominal Surgery in the Cincinnati College of Medicine and Surgery and in the Woman's Medical College of Cincinnati; Surgeon to the Cincinnati Free Surgical Hospital for Women; Secretary-General of the First Pan-American Medical Congress, 1893; Member of the Southern Surgical and Gynecological Society; Fellow of the British Gynecological Society; President of the American Medical Association, 1901. *Executive Council*, 1890–1897; *President*, 1898. Rooms 61 and 62, The Groton, N. E. corner Seventh and Race Streets, Cincinnati, Ohio.

1905.—REES, CHARLES MAYRANT, M.D. Professor of Abdominal Surgery and Gynecology in Charleston Medical School; Member of the Medical Society of the State of South Carolina; Member of the American Medical Association and of the Southern

Surgical and Gynecological Association. Residence, 169 Broad Street; Office, 89½ Wentworth Street, Charleston, S. C.

1896.—*Rhett, Robert Barnwell, Jr., M. D. Charleston, S. C. 1901.

1890.—Ricketts, Edwin, M.D. Professor of Abdominal Surgery and Gynecology at the Cincinnati Polyclinic; Member of the American and British Medical Associations; Member of the Southern Surgical and Gynecological Association. *Vice-president*, 1899; *Executive Council*, 1901, 1904; *President*, 1902. 408 Broadway, Cincinnati, Ohio.

1889.—*Rohe, George Henry, M.D. Baltimore, Md. 1899.

1892.—Rosenwasser, Marcus, M.D. Dean and Professor of Diseases of Women and Abdominal Surgery in the University of Wooster; Gynecologist to the Cleveland Hospital for Women and Children; Consulting Gynecologist to the City Hospital; Member of the American Medical and Ohio State Medical Associations. *Vice-president*, 1903. Residence, 722 Woodland Avenue; Office, 456 Lennox Building, Cleveland, Ohio.

1890.—Ross, James Frederick William, M.D.C.M., L.R.C.P., Lond., Eng. Professor of Gynecology, University of Toronto; Chief of Gynecological Service, Toronto General Hospital; Late President Ontario Medical Association; President Academy of Medicine, Toronto; Fellow of the Edinburgh Obstetrical Society. *Executive Council*, 1892–1896, 1905–1907; *President*, 1897. 481 Sherbourne, Corner Wellesley Street, Toronto, Ont., Canada.

1902.—Runyan, Joseph Phineas, M.D. Division Surgeon to the Choctaw, Oklahoma and Gulf Railroad; Secretary of the Arkansas State Medical Association, President, 1904. 1514 Schiller Avenue, Little Rock, Ark.

1906.—Ruth, Charles Edward, M.D. Professor of Surgery and Clinical Surgery in the Keokuk Medical College (College of Physicians and Surgeons); Surgeon to the Chicago and Rock Island Pacific Railway. Ponce, Porto Rico.

1903.—Sadlier, James Edgar, M.D. Consulting Surgeon to Highland Hospital, Poughkeepsie. *Vice-president*, 1909. 295 Mill Street, Poughkeepsie, N. Y.

1904.—Schwarz, Henry, M.D. Professor of Obstetrics, Medical Department of Washington University. 440 North Newstead Avenue, Saint Louis, Mo.

1901.—Scott, N. Stone, A.M., M.D. Professor of Surgery, College of Physicians and Surgeons, Cleveland; Consulting Surgeon to City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-patient Department of Cleveland General Hospital. Residence, 531 Prospect Avenue; Office, 603–604 Citizens' Building, Cleveland, Ohio.

1895.—Sellman, William Alfred Belt, M.D. Professor of the Diseases of Women and Children at the Baltimore University School of Medicine; Member of the Medical and Chirurgical Faculty of Maryland; also of the Baltimore Medical and Surgical Association; the Gynecological and Obstetrical Association of Baltimore; the Clinical Society; the Baltimore Journal Club; and of the American Medical Association. *Vice-president*, 1908; *Executive Council*, 1909. 5 East Biddle Street, Baltimore, Md.

1889.—*Seymour, William Wotkyns, A.B., M.D. Troy, N. Y. 1904.

1908.—Sherill, Joseph Garland, A.M., M.D. Professor of Surgery and Clinical Surgery at the University of Louisville. Office, Suite 542, The Atherton, Louisville, Ky.

1902.—Simons, Manning, M.D. Professor of Clinical Surgery in the Medical College of the State of South Carolina; Surgeon to St. Francis Xavier's Infirmary and to the City Hospital. Residence, 22 Rutledge Avenue; Office, 111 Church Street, Charleston, S. C.

1899.—Simpson, Frank Farrow, A.B., M.D. Gynecologist to the Allegheny General Hospital; Consulting Gynecologist to the Columbia Hospital. *Vice-president*, 1906. 1112 Bessemer Building, Pittsburg, Pa.

1901.—Skeel, Roland Edward, M.D. Professor of Obstetrics in Cleveland College of Physicians and Surgeons; Consulting Obstetrician to the City Hospital; Obstetrician to the Cleveland General Hospital. 785 Prospect Street, Cleveland, Ohio.

1891.—Smith, Charles North, M.D. Professor of Obstetrics and Clinical Gynecology in the Toledo Medical College;

Gynecologist to St. Vincent's Hospital. 234 Michigan Street, Toledo, Ohio.

1904.—Smith, William S., M.D. Professor of Gynecology in the Maryland Medical College; Gynecologist to Franklin Square Hospital. 330 North Charles Street, Baltimore, Md.

1901.—Stamm, Martin, M.D. Professor of Operative and Clinical Surgery in the College of Physicians and Surgeons, Cleveland. 316 Napoleon Street, Fremont, Ohio.

1902.—Stark, Sigmar, M.D. Professor of Obstetrics and Clinical Gynecology in the Cincinnati College of Medicine and Surgery; Gynecologist to the Jewish Hospital. 1108 East McMillan Street, Cincinnati, Ohio.

1908.—Stewart, Douglas Hunt, M.D. Attending Surgeon at Saint Elizabeth's Hospital; Attending Gynecologist to the Red Cross Hospital. Residence, 121 West 88th Street, New York, N. Y.

Founder.—*Storrs, Melancthon, A.M., M.D. Hartford Conn. (See Honorary List, 1899.) 1900.

1904.—Sutcliffe, John Asbury, A.M., M.D. Consulting Surgeon to St. Vincent's Infirmary; Consultant in Genitourinary Diseases to the City Hospital and to the Protestant Deaconess's Hospital. 824 North Delaware Street, Indianapolis, Ind.

1899.—Swope, Lorenzo W., M.D. Surgeon to the Consolidated Traction Company; Chief Surgeon to Wabash Railroad, Pittsburg Division; Surgeon to Western Pennsylvania Hospital; Surgeon to Passavant Hospital; Member of the Allegheny County Medical Society; Member of the American Medical Association. Residence, 4629 Bayard Street; Office, 1105 Park Building, Pittsburg, Pa.

1908.—Talley, Dyer Findley, A.M., M.D. Associate Professor of Surgery at Birmingham Medical College; Member of State Board of Medical Examiners, State Board of Health and Board of Censors. Residence, 1808 Seventh Avenue, Birmingham, Ala.

1901.—Tate, Magnus Alfred, M.D. Professor of Obstetrics Miami Medical College; President Cincinnati Academy of Medicine. 1905. 19 West Seventh Street, Cincinnati, Ohio.

Founder.—†Taylor, William Henry, M.D., Ph.D. Cincinnati, Ohio. 1898. (See Honorary Fellows.)

1895.—Thompson, Frank Daniel, M.D. Professor of Gynecology in the Medical Department of Fort Worth University. 412 Adams Street, Fort Worth, Texas.

1908.—Torrance, Gaston, M.D. Surgeon to Saint Vincent's and the Hillman Hospitals in Birmingham. Residence, 1626 Eleventh Avenue, South, Birmingham, Ala.

Founder.—*Townsend, Franklin, A.M., M.D. Albany, N. Y. 1895.

1907.—Vance, Ap Morgan, M.D. Surgeon to Kentucky Masonic Widow's and Orphan's Home and Infirmary; Surgeon to Saints Mary and Elizabeth Hospital, Louisville, 835 South Fourth Avenue, Louisville, Ky.

Founder.—Vander Veer, Albert, A.M., M.D., Ph.D. Professor of Didactic, Clinical, and Abdominal Surgery in the Albany Medical College; Attending Surgeon to the Albany Hospital; Consulting Surgeon to St. Peter's Hospital; Fellow of the American Surgical Association (President, 1906); Fellow of the British Gynecological Society; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society. *Executive Council*, 1889–1891, 1895–1905; *President*, 1892. 28 Eagle Street, Albany, N. Y.

1891.—Walker, Edwin, M.D., Ph.D. Gynecologist to the Evansville City Hospital; President of the Indiana State Medical Society, 1892; Member of the American Medical Association and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association; First Vice-president American Medical Association, 1907. *Vice-president*, 1901. 712 Upper Fourth Street, Evansville, Ind.

1907.—Walker, Henry Orlando, M.D. Secretary and Professor of Surgery at the Detroit College of Medicine; Surgeon to Harper Hospital; Surgeon to Saint Mary's Hospital, Detroit. Office, 612 Washington Arcade, Detroit, Mich.

1907.—Weiss, Edward Aloysius, M.D. Assistant Gynecologist to Mercy Hospital; Obstetrician to Roselia Maternity Hospital; Associate Professor of Gynecology at West Penn. Medical College, Pittsburg, Pa. 524 Penn Avenue, Pittsburg, Pa.

1889.—WENNING, WILLIAM HENRY, A.M., M.D. Clinical Professor of Gynecology at the Miami Medical College; Chief of Staff and Gynecologist to St. Mary's Hospital. 5 Garfield Place, Cincinnati, Ohio.

Founder.—WERDER, XAVIER OSWALD, M.D. Professor of Gynecology at the Western Pennsylvania Medical College (Medical Department, University of Western Pennsylvania); Consulting Gynecologist at the Allegheny General Hospital; Gynecologist to the Mercy Hospital and Pittsburg Free Dispensary; Obstetrician to the Roselia Maternity Hospital; Consulting Gynecologist to St. Francis's Hospital; Consulting Surgeon to the South Side Hospital. *Treasurer*, 1888–1909. 524 Penn Avenue, Pittsburg, Pa.

1904.—WEST, JAMES NEPHEW, M.D. Professor of Diseases of Women and Secretary of the Faculty at the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1906. 71 West Forty-ninth Street, New York.

1896.—WESTMORELAND, WILLIS FOREMAN, M.D. Professor of Surgery at the Atlanta Medical College. Suite 241, Equitable Building, Atlanta, Ga.

1897.—WHITBECK, JOHN F. W., M.D. Gynecologist to the Rochester City Hospital; Commissioner of the Board of Health. 322 East Avenue, Rochester, N. Y.

1907.—ZIEGLER, CHARLES EDWARD, A.M., M.D. Professor of Obstetrics in the University of Pittsburg; Obstetrician to the Columbia Hospital; Obstetrician in charge of the Reineman Maternity Hospital; Assistant Gynecologist to the Allegheny General Hospital; Consulting Obstetrician and Gynecologist to the Dixmont Hospital for the Insane. 354 Highland Avenue, Pittsburg, Pa.

1900.—ZINKE, ERNST GUSTAV, M.D. Professor of Obstetrics and Clinical Midwifery in the Medical College of Ohio, University of Cincinnati; Obstetrician and Gynecologist to the German Hospital; Obstetrician to the Maternity Hospital. *President*, 1908; *Executive Council*, 1909. 4 West Seventh Street, Cincinnati, Ohio.

Total, one hundred and seventeen Ordinary Fellows.

MINUTES OF THE PROCEEDINGS

AT THE

TWENTY-FIRST ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

HELD AT THE

HOTEL BELVEDERE, BALTIMORE

SEPTEMBER 22, 23, AND 24, 1908

TWENTY-FIRST ANNUAL MEETING.

SEPTEMBER 22, 23, AND 24, 1908.

The following-named Fellows were present:

BRANHAM, JOSEPH H.	BALTIMORE.
BLUME, FREDERICK	PITTSBURG.
BONIFIELD, CHARLES L.	CINCINNATI.
BROWN, JOHN YOUNG	ST. LOUIS.
CANNADAY, JOHN E.	CHARLESTON, W. VA.
CHASE, WALTER B.	BROOKLYN.
CRAIG, DANIEL H.	BOSTON.
CRILE, GEORGE W.	CLEVELAND.
CROSSEN, H. S.	ST. LOUIS.
CUMSTON, CHARLES G.	BOSTON.
DAVIS, JOHN D. S.	BIRMINGHAM.
ERDMANN, JOHN F.	NEW YORK.
FRANK, LOUIS	LOUISVILLE.
FREDERICK, CARLTON C.	BUFFALO.
GILLETTE, WILLIAM J.	TOLEDO.
GOLDSPOHN, ALBERT	CHICAGO.
HALL, JOSEPH A.	CINCINNATI.
HAYD, HERMAN E.	BUFFALO.
HEDGES, ELLIS W.	PLAINFIELD.
HOWITT, HENRY	GUELPH.
ILL, EDWARD J.	NEWARK.
JOHNSTON, GEORGE BEN	RICHMOND.
KEEFE, JOHN W.	PROVIDENCE.
KIRCHNER, WALTER C. G.	ST. LOUIS.
LYONS, JOHN A.	CHICAGO.
MILLER, AARON B.	SYRACUSE.
MILLER, JOHN D.	CINCINNATI.
MORIARTA, D. C.	SARATOGA.
MORRIS, ROBERT T.	NEW YORK.
NOBLE, THOMAS B.	INDIANAPOLIS.
PANTZER, HUGO O.	INDIANAPOLIS.

PORTER, MILES F.	Fort Wayne.
POTTER, WILLIAM WARREN	Buffalo.
PRICE, JOSEPH	Philadelphia.
REDER, FRANCIS	St. Louis.
REES, CHARLES M.	Charleston.
SADLIER, JAMES E.	Poughkeepsie.
SCHWARZ, HENRY	St. Louis.
SELLMAN, WILLIAM A. B	Baltimore.
SKEEL, ROLAND E.	Cleveland.
SMITH, WILLIAM S.	Baltimore.
STAMM, MARTIN	Fremont.
SWOPE, L. W.	Pittsburg.
TATE, MAGNUS A.	Cincinnati.
VANCE, AP MORGAN	Louisville.
WENNING, W. H.	Cincinnati.
WERDER, XAVIER O.	Pittsburg.
ZIEGLER, CHARLES E.	Pittsburg.
ZINKE, E. GUSTAV	Cincinnati.

Letters and messages of regret were received from the following-named absent Fellows:

Honorary.—Cordes, August Elisee; Martin, August; Mathews, Joseph McDowell; Sinclair, Sir William Japp; Sternberg, General George Miller; Wyman, General Walter.

Corresponding.—Crozel, G.; Ellis, Guilherme; Lane, Horace Manley; Wright, Adam Henry.

Ordinary.—Abrams, Edward Thomas; Asdale, William James; Baldwin, James Fairchild; Bandler, Samuel Wyllis; Bell, John Norval; Dorsett, Walter Blackburn; Guenther, Emil Ernest; Guiteras, Ramon; Hall, Rufus Bartlett; Holmes, Josus B. S.; Humiston, William H.; Linville, Montgomery; McMurtry, Lewis Samuel; Manton, Walter Porter; Morris, Lewis Coleman; Murphy, John Benjamin; Vander Veer, Albert; Walker, Edwin; West, James Nephew.

The following-named registered guests were made members by invitation:

Allen, L. M.	Baltimore.
Biedler, H. H.	"
Bond, A. K.	"
Branham, H. G.	"
Branin, C. N.	"
Brinton, Wilmer	"

Caspar, W.	Baltimore.
Cox, Walter A.	"
De Hoff, G. W.	"
Hunner, Guy L.	"
Hurdon, E.	"
Mayer, W. A. H. R.	"
Mortimer, Egbert L.	"
Neff, John	"
Noonk, Emil	"
Palmer, L. R.	"
Perry, W. B.	"
Potter, J. S. H.	"
Rollins, C. D.	"
Shamn, Maurice E.	"
Shippen, L. P.	"
Taneyhill, G. Lane	"
Warner, R. A.	"
Weber, Fred W.	"
Wiley, Z. K.	"
Zepp, H. E.	"
Englebach, William	St. Louis.
Evans, P. S., Jr.	Yangchoir, China.
Golarborough, M.	Cambridge.
Graham, Hannah M.	Indianapolis.
Hathaway, Robert E.	Glendine.
Homans, John	Boston.
Kahler, J. Frank	Canton.
Kautz, F. A. S.	Cincinnati.
McNemar, O. H.	Odenton.
Marcle, E. J.	Canton.
Ramos, N. J.	New York.
Smith, Lee H.	Buffalo.
Sprigg, Wm.	Washington.
Stone, I. S.	Washington.

FIRST DAY—*Tuesday, September 22, 1908.*

Morning Session.—The Association met at Hotel Belvedere, at 9:30 A. M., and was called to order by the President, Dr. E. Gustav Zinke, Cincinnati, Ohio.

The President introduced Honorable J. B. Mahool, Mayor of Baltimore, who delivered the following

ADDRESS OF WELCOME.

Mr. President and Gentlemen: I am sure the citizens of Baltimore and myself, as Mayor, are very glad to extend to you a most cordial welcome to our city. We have taken no small part in the arts and sciences and literature of the day. Baltimore city is an educational center. We have some of the largest educational institutions in this country. I have but to mention The Hopkins, the Woman's College, the Peabody Institute and colleges of medicine and surgery and dentistry, to say nothing of the other efforts that are being made in the way of educating and qualifying men to go out into the world to help their fellows. There is no profession (I suppose you have often been told this before, but I say it sincerely) that is doing more to put themselves out of business than doctors. You are working all the time in order that people may be well all the time, so that they will not need the care of physicians. You are doing this gradually by improved conditions of hygiene and improved methods of living. I hope we will come to that event to which the whole creation moves,—namely, when we reach the millenium, and when that time comes, and not until then, the physician will take quite a part in treating the army of mankind.

There has been great advance along the lines of medicine and surgery in the matter of tuberculosis. We know of the treatment that is being so much spoken of at the present time, and how they are advocating the open-air treatment and urging people to get right down to nature, so to speak, and we are beginning to realize, both physicians and laity, the fact that the Almighty has put so many things around us and within our reach, in His greatness and goodness, that we can get without money and without price. It used to be the custom for people to close their windows at night or when any of the members of the family were sick. They kept the sick from getting plenty of fresh air. We know now that there is very little or no danger from the night air, and even ignorant people are beginning to realize the salutary effects of pure air, pure water, and pure methods and means of living. Therefore, I believe physicians are doing a great work for humanity; I know they are doing a great work for humanity by teaching women and men how to live properly.

We are glad to have you with us; we are glad to have the

benefits of the observations you will make from time to time; we are glad to have the benefit of the addresses that will be given before your Association for the purpose of enlightening our citizens generally upon the matters that you will dwell upon, and Baltimore city extends to you a most cordial welcome.

We have done many things here in the past. It is a matter of history as to the part Baltimore has taken in the arts and sciences and literature of the day. You will find among our people those who are ever ready to extend to you a hearty welcome, believing that you will do splendid work in the community and in the cities which you represent. I am glad to be with you, and I hope you will have a pleasant time while you are with us.

You doubtless know that a great fire occurred here some four years ago which devastated a large part of our city. Since that time there has been an increase of many millions of dollars in our property from the fact that more commodious buildings have been erected upon the sites where the fire occurred. We have had considerable increase in our population, and we are now talking about extending our city limits beyond what they are at the present time, and situated as we are on the eastern seaboard and being a gateway of the south, with the possibilities of the Chesapeake Bay and river going out into the Atlantic Ocean, with the Baltimore and Ohio and Pennsylvania Railroads, as well as other railroads, extending into our midst, our city will continue to grow and hold out to those who are making researches, who are doing great things in the commercial world, who are seeking to help their fellows in every avenue of trade and science and literature, great inducements. You will find among our people those who will encourage such work.

I thank you for the invitation extended to me to welcome you to this city. We are very glad to welcome you here and hope you will have a good time while you are with us. (Applause.)

The President introduced as the next speaker Dr. Brice W. Goldsborough, President of the State Medical Association, who delivered an address of welcome in behalf of the profession of Maryland.

ADDRESS OF WELCOME BY DR. GOLDSBOROUGH.

Mr. President and Fellows of the American Association of Obstetricians and Gynecologists: During the past six months, since I was honored by the fraternity of the State and elected to the Presidency of the State Society, it has been my duty as well

as pleasure to address many assemblages of physicians. Upon each occasion, as I looked into their earnest faces, I have more and more rightly comprehended and grasped the desire and sincerity of these bodies of intelligent men in their efforts to lift themselves up to the fullest realization of their duties, and I have gained a new and better appreciation of the intense and burning effort which now actuates the members of the profession to equip themselves for the broadest and most useful conduct of their life's work by every possible means. Among these none can be more helpful or stimulating than these meetings, where by word of mouth each one endeavors to help others; and the interchange of many views and opinions must most materially aid in reaching such wise conclusions, that humanity is benefited and the knowledge of the individual physician enormously increased, to say nothing of the social side and the relaxation so requisite to those who lead a demanding and laborious life.

The thought, too, has constantly recurred of how thoroughly these gentlemen have dedicated their lives to their chosen profession, and with what earnestness as well as success they seek after the truth, until we may well say that, at last, we are getting out of the darkness of empiricism, into the broad sunlight of science. One of the wisest of our craft has said: "The past century is memorable above all others for the gigantic progress of the natural and physical sciences—a progress which has influenced more profoundly the lives and thoughts, the position and prospects of mankind than all the political changes, all the codes and legislations. In all this marvelous scientific advancement in all directions, the science of living beings and their manifestations has influenced the material, intellectual, and social conditions of mankind as much as the sciences of inanimate matter and its energies. So far as the happiness of human beings is concerned, there is no other gift of science comparable to the increased power acquired by medicine to annul or lessen physical suffering and to restrain the spread of pestilential disease."

In this splendid and humanitarian achievement, the labors of obstetricians and gynecologists of this nation have played and will continue to play a most conspicuous part. As woman is the weaker vessel and seems destined by the nature of her being, as well as the awful ordeal of maternity, to suffer in many ways from which man happily escapes, the necessity for your special existence is not only justified, but a high duty as well as privilege comes to you of relieving these unfortunates. By their restora-

tion to health and usefulness not only is the State benefited, happiness restored to thousands of families, the woman rendered able to take up her work, but to this is added the further benefit that the high and noble duty of woman—the duty of motherhood—becomes possible. When we pause to consider from our own personal experience what a wife means to a man, we can, in some slight way, grasp the agony and despair of the husband who brings to one of you gentlemen his beloved grievously afflicted. And we can appreciate, too, the awful distress of the son for his mother or his sister. For surely to the physician, overtaxed in mind and body, struggling for his daily bread and weighed down by the awful responsibilities of his calling, a gentle, loving wife is the greatest of all good gifts. To all fair things she will lend a fairer charm, and from the home she will help him to create will come maturity, the hope and the courage with which he fights the battle of life. To her will be justly due full half the success, and far more than that proportion of all the happiness of his life, to say nothing of those blessed mothers, whose very names stir in our hearts the tenderest memories and unspeakable gratitude, and whose voices still linger with us as a benediction. To you, then, come these mothers and sisters seeking relief, and can there be a greater privilege than to snatch these unfortunates from the abyss of despair back to the glad shores of good health? It makes no difference what the sacrifice may be on your part, for then you truly fulfil the motto of the great German poet, which says that with self-renunciation we begin to live. The old farmer in the gospel, according to Whitcomb Riley, says:

"Doc, you 'pear so spry, jes' write me that recei't
You have fer bein' happy by,—fer that'd shorely beat
Your medicine, says I. And quick as scat Doc turned and writ
And handed me, "Go he'p the sick, and put your heart in it!"

What a precious destiny for any man to spend his life in aiding others! In all this splendid uplift in our profession, another glorious germ has been planted and taken deep root, the germ of fraternity and unity, that even thus early we may commence to feel that perhaps the golden dream of all the ages of men, of the fatherhood of God and the brotherhood of man, may not be so distant. It is my earnest hope that your deliberations

may not only be attended with great profit to every one of you professionally, that many mooted points whose settlement means so much to mankind may be elucidated, but with all this, and added to this, that beautiful and fraternal spirit may be fostered among you to such a degree that the world may take notice of you and rejoice with you. Such a cause deserves, nay demands, our fullest, or best, and our most sacred consideration.

On behalf of the profession of Maryland, I bid you welcome to this city, which stands for what is best in medicine, and which now with open arms and a glad heart rejoices that you are here with us. (Loud applause.)

RESPONSE TO ADDRESSES OF WELCOME BY DR. KEEFE.

Dr. John William Keefe, Providence, Rhode Island, in responding to the addresses of welcome, spoke as follows:

Mr. President and Fellows: It is certainly a pleasure to be asked to respond to the kind and eloquent words of welcome that have been extended to us by His Honor, the Mayor, and Dr. Goldsborough, President of the State Medical Association, and on behalf of the American Association of Obstetricians and Gynecologists, I thank them for their cordial greetings. We have looked forward to our meeting in Baltimore with anticipations of a very profitable and enjoyable gathering, and I feel that we will not be disappointed if my former experiences in Baltimore are duplicated. Again, I thank the gentlemen for their gracious words of greeting. (Applause.)

REPORT OF COMMITTEE OF ARRANGEMENTS.

Dr. William A. B. Sellman, *Chairman of the Local Committee of Arrangements*, said: *Mr. President and Fellows:* The Committee of Arrangements has taken great pleasure in making preparations for this meeting, and we now extend to you a most hearty welcome to our city. We, members of the medical profession, consider that this is an event in our lives, having the American Association of Obstetricians and Gynecologists to meet in Baltimore, and we shall do everything in our power to make your visit profitable as well as pleasurable. If you gentlemen come across a scarlet badge, take hold of the man that wears it and pull it, and anything that belongs to him is yours. (Applause.)

I have the honor to announce the program for the entertainments will be this: We will commence with a clinic at 9

o'clock to-morrow at The Hopkins. The trustees of the Johns Hopkins Hospital have extended to the members of this Association an invitation to a luncheon after the clinic, to which all members are invited as well as guests.

The annual dinner will be given tomorrow night at seven-thirty o'clock.

On Thursday, at one o'clock, a luncheon will be given at the University Club.

Papers were then read, as follows:

1. "Arteriosclerosis," by Charles M. Rees, Charleston.

Discussed by Drs. Frederick, Pantzer, Blume, Lyons, Skeel, Cumston, and Goldspohn.

2. "Hysteria as the Surgeon Sees It," by Ap Morgan Vance, Louisville.

Discussed by Drs. Hayd, Cumston, Lyons, Skeel, and in closing by the essayist.

3. "Comparative Merits of Abdominal Celiotomy and Colpotomy in the Treatment of Intrapelvic Abscess," by William S. Smith, Baltimore.

Discussed by Drs. Bonifield, Goldspohn, Frederick, Blume, Hall, Reder, Frank, Branham, and in closing by the essayist.

4. "A Simple, Certain, and Universally Applicable Method of Preventing the Serious Accident of Leaving a Sponge in the Abdomen," by H. S. Crossen, St. Louis.

Discussed by Drs. Hayd, Keefe, Skeel, Bonifield, Reder, Lyons, Chase, and in closing by the essayist.

On motion, the Association took a recess until 2:30 P. M.

Afternoon Session, 2:30 o'clock.

The President in the Chair.

5. "Mobility of the Patient after Laparotomy," by Walter B. Chase, Brooklyn.

Discussed by Drs. Goldspohn and Craig.

6. "Ectopic Gestation, with Living Child, with Report of Three Cases," by X. O. Werder, Pittsburg.

7. "Extrauterine Pregnancy," by Herman E. Hayd, Buffalo.

8. "Ectopic Pregnancy," by Charles L. Bonifield, Cincinnati.

These three papers were discussed jointly by Drs. Goldspohn, Frederick, Schwarz, Miller, Chase, Porter, Noble, Lyons, Blume, Reder, Skeel, Cumston, and in closing by the essayists.

9. "Acute Pancreatitis, with Report of Cases," by Louis Frank, Louisville.

Discussed by Drs. Noble, Kirchner, and in closing by the author of the paper.

On motion, the Association took a recess until 7:30 P. M.

Evening Session, 7:30 o'clock.

The President in the Chair.

10. "Abscess of Gaertner's Canal, with Report of a Case," by Magnus A. Tate, Cincinnati.

Discussed by Drs. Goldspohn, Frederick, and in closing by the essayist.

11. "Resumé of Present Status of Cesarean Section," by C. C. Frederick, Buffalo.

12. "The Development of the Human Ovum During the First Eight Weeks of Pregnancy," by Henry Schwarz, St. Louis.

13. "The President's Address"—Subject, "Solving the Problem of Obstetrics," by E. Gustav Zinke, Cincinnati.

These two papers with the President's address (at the request of the President) were discussed together by Drs. Stamm, Sellman, Ill, Lyons, Frederick, and the discussion closed by Dr. Zinke.

Adjourned.

SECOND DAY—*Wednesday, September 23, 1908.*

Note.—The Fellows and guests took a street car at the Hotel Belvedere at 8:20 A. M., and went to the Johns Hopkins Hospital, where clinics were given by Drs. J. M. T. Finney, Harvey Cushing, Howard A. Kelly, and Guy Leroy Hunner.

At the conclusion of the clinics a luncheon was served at the hospital.

Afternoon Session, 2 o'clock.

14. "Intraligamentous Fibroids," by John F. Erdmann, New York.

15. "Uterine Fibromata Complicating Pregnancy; Cases and Specimens," by William J. Gillette, Toledo.

16. "Remarks on Myoma of the Cervix Uteri, with Presentation of Specimen," by Francis Reder, St Louis.

These three papers were discussed conjointly by Drs. Schwarz, Craig, Bonifield, Zinke, and in closing by Dr. Gillette.

17. "Ovarian Cystoma Complicating Pregnancy," by Charles Greene Cumston, Boston.

Discussed by Drs. Schwarz, Ill, Zinke, Frederick, and Noble.

18. "Subdiaphragmatic Abscess, with Report of Cases," by John W. Keefe, Providence.

Discussed by Drs. Bonifield, Goldspohn, Stone, Hayd, Porter, Hall, Hedges, Reder, Pantzer, and in closing by the essayist.

On motion, the Association took a recess until 9:30 A. M., Thursday.

THIRD DAY—*Thursday, September* 24, 1908.

Morning Session.—The Association met at 9:30 A. M., with the President in the Chair.

19. "Factors of Safety in Abdominal Operations Based on Operations," by George W. Crile, Cleveland.

Discussed by Drs. Skeel, Porter, and in closing by the essayist.

20. "Injuries to the Bladder Occurring During Hernia Operations," by Roland E. Skeel, Cleveland.

Discussed by Drs. Branham, Sprague, Pantzer, Goldspohn, Crile, Morris, Kirchner, and in closing by the essayist.

21. "Gastric Tetany; Operation; Recovery," by John Young Brown and William Engelbach, St. Louis.

Discussed by Dr. Erdmann.

22. "Treatment of Typhoid Perforations," by John D. S. Davis, Birmingham.

Discussed by Drs. Noble, Porter, Hayd, Sellman, Cannaday, and in closing by the author of the paper.

23. "Typhlitis," by John A. Lyons, Chicago.

Discussed by Dr. Morris and in closing by the essayist.

24. "Some Old Fallacies in Retroversion Surgery," by Albert Goldspohn, Chicago.

25. "Repair Rather than Removal of the Internal Generative Organs of Women," by John E. Cannaday, Charleston.

These two papers were discussed together by Drs. Hayd, Morris, Noble, and in closing by Dr. Goldspohn.

26. "Experiments upon Animals Relative to the Question of Abdominal Supporters after Laparotomy," by Robert T. Morris, New York.

Discussed by Drs. Chase, Cannaday, Porter, Goldspohn, and in closing by the essayist.

THE SECRETARY.—The Council asks the passage of these resolutions:

Resolved, That the thanks of the Association are due, and are hereby tendered, to the Chairman of the Committee, Dr. William A. B. Sellman, and to his colleagues, Drs. Joseph H.

Branham and William S. Smith, for the completeness of the preparations for the meeting, and for the annual dinner; also for the uniform courtesy shown the Fellows and guests during the entire three days of our sojourn in Baltimore. And, further, for the entertainment at luncheon on Thursday at the University Club.

Resolved, That the thanks of the Association be tendered to the management of the Hotel Belvedere for the care taken of the members and guests; to the newspaper men for their courteous treatment of our proceedings in reducing to type the work of the several sessions; and to all others who have contributed to the comfort and pleasure of the membership and guests.

It was moved that the resolutions be adopted.

Seconded; carried.

DR. SELLMAN.—I desire to express to the Fellows the great pleasure it has given us, the members in Baltimore, to have you with us. I promised you last September, at the meeting in Detroit, we would give you a good time and excellent facilities for carrying on the business of the Association successfully. The business meetings have been successful; but so far as our hospitality and entertainments are concerned, you are the judges, and your countenances show that you have appreciated our efforts. We have done our best to make your brief stay here as pleasant as possible. (Applause.)

In the absence of the President-elect, Dr. Humiston, the Chair appointed Drs. Porter and Miller to escort the two Vice-Presidents (Drs. Davis and Sadlier) to the platform.

The retiring President, Dr. Zinke, in addressing the Vice-Presidents, with gavel in hand, said: I have safely made another voyage and am just about to anchor. In a sound condition I deliver the Association into your care, and I know that you will do your best to maintain its heredity and make it last forever. (Applause.)

Dr. Sadlier said: My powers of oratory are not such as to enable me to take the place of our distinguished colleague, the President-elect, Dr. Humiston; but we are about to close a session which has been replete with excellent papers and magnificent discussions. Let us trust that during the interval such excellent work will be done by each member of the Association that the Fort Wayne meeting next fall shall be like this, one of the banner meetings of the Association, and which shall not

only reflect credit upon the individual members, but upon the Association at large. (Applause.)

Dr. Davis was introduced and said: It is a great pleasure to be a Fellow of this Association. It is a great organization, and to be one of its officers is a greater pleasure. I think I can say for our absent officer and chief that he will do his best, and so will we. (Applause.)

On motion, the Association then adjourned.

WILLIAM WARREN POTTER, *Secretary.*

EXECUTIVE SESSIONS.

Tuesday, September 22, 1908.

The President in the Chair.

On behalf of the Executive Council, the Secretary presented a list of applicants for Fellowship, after which the Association elected by ballot the following-named candidates: Samuel H. Buteau, Oakland, California; Ellis W. Hedges, Plainfield, N. J.; Walter C. G. Kirchner, Saint Louis, Mo.; Douglas Hunt Stewart, New York; Gaston Torrance, and Dyer F. Talley, Birmingham, Alabama; and J. Garland Sherrill, Louisville, Kentucky.

The Secretary presented the accounts of the Secretary and Treasurer for auditing, and moved that an Auditing Committee be appointed at this time. Carried.

The President appointed as Auditing Committee Drs. John Miller, Cincinnati; and Francis Reder, St. Louis, to report at a subsequent executive session.

The Secretary stated that he had received several letters and telegrams from absent Fellows, but as these would be mentioned in the official minutes, it was hardly necessary to read them.

Adjourned.

Thursday, September 24, 1908.

The Executive Session was called to order by the President at 5 o'clock, immediately after the adjournment of the scientific session.

The Auditing Committee reported having examined the accounts of the Secretary and Treasurer, and had found them correct with a balance of $170.05 in the treasury.

On motion, the report was adopted.

The Secretary stated that he had received two applications

for Fellowship since yesterday—namely, Dr. D. F. Talley, Birmingham, Alabama, and Dr. George C. Mosher, Kansas City, Missouri.

On motion, the rules were suspended, and the two gentlemen were declared duly elected Fellows of the Association.

The Secretary moved that such papers on the program as had not been read be considered read by title and published.

Seconded by Dr. Bonifield.

After some remarks by Drs. Porter, Lyons, and Davis, the matter was left to the discretion of the Secretary.

The election of officers resulted as follows:

President, William H. Humiston, Cleveland; *First Vice-President*, J. E. Sadlier, Poughkeepsie; *Second Vice-President*, John D. S. Davis, Birmingham; *Secretary*, William Warren Potter, Buffalo; *Treasurer*, X. O. Werder, Pittsburg; *Councilors*, E. Gustav Zinke, Cincinnati; Herman E. Hayd, Buffalo, and William A. B. Sellman, Baltimore (the latter to fill unexpired term of Dr. Humiston).

Dr. Herman E. Hayd.—Last year, at the Detroit meeting, I opened a subscription list, and collected about five hundred dollars, and, as the Chairman of that Committee, I bought this watch and chain at Tiffany's and also got up this beautiful memoir which contains the names of the subscribers to the fund. Dr. Potter has had the pleasure and satisfaction of carrying this watch and of wearing this chain for a year, and now I wish to make him a formal presentation of it. (Here Dr. Hayd handed the watch to Dr. Potter amid applause.)

Dr. Potter, in accepting the gift, said: It is hardly necessary for me to say that I appreciate this testimonial more than I can express in words. When the matter was brought before the Executive Session last year at Detroit, I did not feel as though I could say anything, but I have worn this watch about ten months, and I have become used to it, and I want to say to the Fellows, first, last, and always, the interests of this Association are in my heart. I feel so grateful to you that I cannot make any more appropriate speech than to express my thankfulness for and appreciation of this splendid gift. (Applause.)

Fort Wayne, Indiana, was selected as the place for holding the next annual meeting; time, third Tuesday in September, 1909, subject to any change which the Executive Council may see fit to make after further conference with Dr. Porter.

There being no further business to come before the meeting, the Executive Session then adjourned.

William Warren Potter, *Secretary.*

PAPERS

READ AT THE

TWENTY-FIRST ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

HELD AT THE

HOTEL BELVEDERE, BALTIMORE

SEPTEMBER 22, 23, AND 24, 1908

THE PRESIDENT'S ADDRESS.

SOLVING THE PROBLEM OF OBSTETRICS.

BY

E. GUSTAV ZINKE, M. D.,

Cincinnati.

ANOTHER year and we will celebrate the 100th anniversary of ovariotomy and honor the memory of its father, Ephraim McDowell. The impulse given to surgery by the invention of ovariotomy cannot be overestimated. It marks distinctly the beginning of the formative period of surgery, a period which closed with the introduction of antisepsis by Lister in 1872 and brought us to the present practical era of the art of healing by manual operations.

The inventions, discoveries and improvements in medicine and surgery within the last one hundred years have not only revolutionized the healing art, but brought it to a state of completeness never anticipated by the brightest minds and the deepest thinkers of the past. The student of medical history marvels at the amount of hard work done and the astonishing, almost miraculous results obtained within so short a time. He also marvels why so little was accomplished in the thousands of years that passed before.

It is not intended to recount or pass in review all the epoch-making events in medicine, obstetrics and surgery that have transpired during the last 100 years. You are all familiar with the achievements of McDowell (1809); of the elder Naegele, who (1812) gave us the "Euclid of Obstetrics," the mechanism of labor; of Long, Wells, Morton and Warren, who discovered and applied anesthesia (1842–1846); of Semmelweis (1846), who was the first to discover antisepsis, and of Pasteur and Koch (1865–1871), who laid the foundation of it, and of Lister, who introduced it into surgery, 1872; of Samuel D. Gross, who wrote the first book of pathology, 1838; of Virchow, the author of cellular pathology (1856); of Spencer Wells, Keith, the Atlees, Dunlap and

Lawson & Tait, the pioneers of abdominal surgery; of Marion Sims, the elder Emmett, Thomas and Mundé, the pioneers of gynecology; also of Tyler Smith, J. Y. Simpson and Barnes, of England; of Spiegelberg, Scanzoni, Schroeder, Saenger, of Germany; of Cazeaux and Tarnier, of France; of Hodge, Fordyce Barker, Lusk and Parvin, of America, each of whom contributed to the development of the obstetric art.

The intricacies of embryology, of which little or nothing was known at the beginning of the last century, have been laboriously traced, correctly interpreted and made an almost complete science by Baer, His, Koelliker, Waldeyer, Schultze, Balfour and others. The wonderful results obtained from research work in histology, pathology, physiology and medical chemistry challenge the admiration of the world.

On occasions like this it is well to pause and consider the amount of labor expended on the numerous discoveries, numberless inventions and the valuable improvements made within recent times and ask ourselves, "What remains to be done? Have we realized to the fullest extent the advantages that have accrued to us from the great progress made in medicine and surgery?"

The invention of new means and methods, the discovery of new facts and conditions, are rarely followed by their immediate adoption and application in practice. Not infrequently their introduction and acceptance is preceded by hot and acrimonious discussion and persistent and strenuous opposition. All know the violent and vicious war waged against ovariotomy. The introduction of anesthesia, especially into the practice of obstetrics, was bitterly opposed for many years. Semmelweis, though he showed ample proof and demonstrated beyond a doubt the value of antisepsis, experienced a sad and unmerciful defeat at the hands of his confrères, and one of the greatest of discoveries was consigned to oblivion for twenty-five years. Every new operation of magnitude, more particularly hysterectomy, oophorectomy, salpingectomy, appendectomy, all operations upon the biliary passages and gastrointestinal tract has been generally accepted only after protracted opposition. The ever-present disposition on the part of the profession to resist the introduction of new discoveries and inventions into the practice of medicine and surgery must not be regarded lightly or wholly condemned. It is the gantlet which every method of treatment proposed should run. Unfortunately, it often occurs that the

discovery of valuable facts and new means and methods of treatment based upon them are not appreciated at the time. Sometimes years pass before the advantages of the proposed new means and measures are fully recognized. Sometimes they are doomed to temporary oblivion, only to be rediscovered or reinvented in the future. The rule is, however, that that which possesses merit is sooner or later accepted and finally becomes the property of the profession, and suffering mankind reaps the benefit.

It would be difficult to overstate the blessings bestowed upon humanity by the discovery of anesthesia and of antisepsis and asepis. Their introduction into the practice of medicine and surgery have wrought vast and beneficial changes in the therapy of every disease and incidental complications, and have, immeasurably, increased the usefulness of the physician and surgeon. This is true to such an extent that it would seem as though there was no longer room for further improvement, especially in the domain of surgery and obstetrics. But to the careful student of the events of the past and to the discerning observer of present conditions, new avenues of thought and action have opened. To him it is clear that, without further new remedies, improved instruments or extended operations, beneficial changes in present practices and customs could be made to the advantage of the afflicted. In no other department of our profession is this more true than in obstetrics.

SOLVING THE PROBLEM OF OBSTETRICS.

Changes in the practice of midwifery within the last fifty years have been marked, and the results obtained, especially since the advent of antisepsis, are by far the most favorable in the history of obstetrics. But of late one fact has become quite apparent: like a specter of bitter reproach it stands forth and may be seen (between lines) in nearly every chapter in our modern text-books on obstetrics; namely, *There has been no improvement in the maternal and fetal mortality and morbidity of midwifery, except in hospital clinics and in maternities, for the last twenty years!* Professor Leopold, in a lecture delivered December, 1907, made the following statement: "From 300 to 400 women die annually during confinement in Saxony; in Prussia, 4339; and 6000 deaths occurred from puerperal causes in the German Empire in the past year." Leopold is right when he says: "These figures follow immediately the mortality-rate of tuberculosis, and the war against such a mortality should be

carried on much more energetically than the war against smallpox and cholera."

The sole object of obstetrics is, and always has been, to solve the problem of the ever-recurring conflict between the mother and the child to be born. Fortunately, a great majority of births are easy, devoid of difficulty, and help is not needed. But in the sum total of child-bearing women, we continuously find labor complications which render a physiological termination of the act of birth difficult or impossible. In every case of eclampsia, placenta previa, oblique or transverse presentation, narrow or contracted pelvis, we witness a conflict unto death between mother and child. Even to this day, especially in private practice, the best the obstetrician can do is to try to save one of the lives thus put in jeopardy. Usually the child is sacrificed to save the more valuable life of the mother. Not infrequently both lives are lost in the attempt to save one.

In the preantiseptic period, Cesarean section and symphyseotomy were equivalent to a verdict of death for the mother. Either operation was, therefore, rarely performed, and many, if not most, of the great obstetricians of the past, up to the last quarter of the nineteenth century, never performed these operations.

During the primitive era of midwifery (before the invention of the forceps), when the child could not be born by the unaided efforts of nature, the obstetrician had the choice of two definite operations, namely, version with manual extraction or, when this course was impossible, embryotomy was his last resort. In those days, too, the midwife was the recognized attendant upon the parturient The physician was called upon only when spontaneous termination of labor seemed impossible and, as he knew but little more of the anatomy and physiology of labor than the midwife, his function was to deliver the patient at all hazards by version and extraction or by perforation of the child. In cases where turning was sufficient, the life of the child was, as a rule, lost; in cases where the disparity between the pelvis and the child's head was too great, embryotomy was the only recourse. Both methods placed the life of the mother in great danger.

With the invention of the forceps by the Chamberlins (1600–1747) the formative period of midwifery began; it ended when Naegele (1812) published the first full description of the mechanism of labor. The forceps, now much improved, became a blessing

in the thousands of cases in which labor was delayed or was complicated by uterine atony, prolapsus funis, hemorrhage, fever, eclampsia and pressure-gangrene of the pelvic soft parts. The forceps solved the problem of saving mother and child in cases of vertex presentation with sufficiently ample pelvis. Nevertheless, the field of labor complications, which could be overcome only by sacrificing the child, remained still quite large.

With the advent of the forceps in 1747, the date of their first publication by Van der Swam and Peter Rathlaw, a rapid progress in the development of the obstetric art is observed in England, Holland, France, Denmark and Germany, and with the correct interpretation of the phenomena of labor came the demonstration that the most frequent cause of prolonged and difficult labor was a faulty or pathological construction of the mother's bony pelvis.

The clinical features of placenta previa and eclampsia were well understood. Still, the practical therapy of both complications has ever since been the subject of extensive scientific study and of bitter and sometimes very offensive discussion. While the problem of obstetrics, so far as these two complications are concerned, is not yet solved, it is none the less surprising how many obstetricians of to-day adhere to the teachings of the old masters in the treatment of these anomalies, ignoring the fact that the means of assistance have been made more efficient and extensive through the introduction of antisepsis and asepsis.

The most popular therapy of narrow pelvis at the present time, except in some of the maternities and hospital clinics, is the high application of the long forceps, or version and extraction of the child, or the induction of artificial labor at a period when the child is viable, but still small enough to pass through the bony ring of the pelvis. These operations, as well as Cesarean section and symphyseotomy, have come to us from the preantiseptic period. The latter two operations had rarely been attempted upon the living. This was undoubtedly good practice then. But the best and most recent authors of the European continent, especially Pinard, Zweifel, Gigli, Doederlein, Bumm and Baisch, claim that in the present aseptic and antiseptic period the therapy of narrow pelvis should exclude the prophylactic resort to the high forceps, version and artificial premature labor, because of the high maternal mortality, 10 per cent., and the enormous fetal death-rate, 50 per cent.

It is also maintained and cannot be successfully controverted

that this high mortality is the result of early interference in cases of narrow pelvis, a practice prompted and justified by dread of protracted labor and fear of childbed fever, which so often followed in such cases. For the same reason the expectant method of treatment was, until very recently, discarded entirely. The high forceps, prophylactic version and perforation were resorted to early because the obstetrician would take no chances. Thus nature was given no opportunity to show that spontaneous labor was possible in many victims of narrow pelvis.

We must all recognize that since the introduction of antisepsis into midwifery prophylaxis of puerperal fever is established, and that the treatment of narrow pelvis, rigidity of the soft parts, prolapsus funis, placenta previa and eclampsia has beeh greatly changed. From the moment the fear of puerpern fever ceased to be the obstetrician's nightmare, the necessita of dragging the child through a narrow pelvis with the·higy forceps, by version and manual extraction at any cost, disappeared. Confidence in nature's forces returned and the results thus far obtained by the expectant method in the management of labor complicated with narrow pelvis, have proved that many patients delivered themselves spontaneously who previously had been delivered with the aid of the high forceps, version, induction of premature labor, craniotomy, aye, even Cesarean section. To this extent the problem of obstetrics is brought nearer solution.

According to Baisch, "the period of compromise operations records in narrow pelvis about 60 per cent. spontaneous births (Chrobak, Gusserow); other obstetricians, like Braun, only 35 per cent." If we are made to understand that in the past from 50 to 60 per cent. of all women with narrow pelves were delivered by operative interference and that within recent years Saxinger, Pinard, Zweifel and Doederlein (quoted by Baisch) have secured 80 per cent. of spontaneous births with the expectant treatment of narrow pelvis, we can realize the extent and importance of the progress made. But we must also comprehend that such results can be obtained only in hospital clinics and maternities or in a home where perfect asepsis can be established and where trained assistants and a competent obstetrician are in attendance.

It is the opinion of Baisch, Zweifel, Bumm, Doederlein and a few others that the problem of obstetrics has been solved in an ideal manner in cases of narrow pelvis, and that there remains

but a small percentage of cases, 6 to 8 per cent., in which the problem of ending the conflict between mother and child is yet to be solved. These are the higher grades of justo-minor and contracted pelves. But even in these cases the mortality of both mother and child has been greatly reduced by the reestablishment of Cesarean section and symphyseotomy. These two operations, formerly exceedingly dangerous to the mother, have produced within the last eighteen years most excellent results when performed early, by skilful operators, in hospitals and under strict antiseptic precautions.

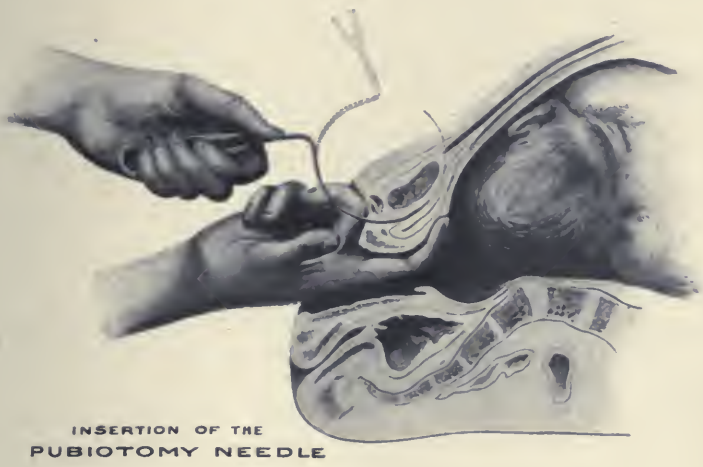
The modern method of performing Cesarean section, as formulated by Pinard, Saenger, Zweifel and Hirst, and the substitution of pubiotomy as devised by Gigli and the subcutaneous hebosteotomy of Doederlein have given these operations a degree of safety never dreamed of before nor generally appreciated now. Zweifel is credited with 55 Cesarean sections with the loss of only one mother; Schauta with 111 Cesarean sections and but one maternal death. The latter operated 75 times for relative indications and all mothers lived. Hirst has had but one maternal death in his last 36 sections and Davis lost only one of the 43 upon whom he performed abdominal hysterotomy. There are, however, certain dangers of Cesarean section which cannot be eliminated by even the best operators and under the most favorable environment. The dangers consist of infection occurring prior to the operation, of the relatively frequent occurrence of ileus after the operation, the complications that may arise in subsequent pregnancies from the uterine scar and from adhesions, fistula and hernia. These elements of uncertainty leave Cesarean section still within the realm of hazardous procedures, and in the treatment of narrow pelvis it is only relatively indicated.

Symphyseotomy within the last twenty years and of late Gigli's pubiotomy and Doederlein's hebosteotomy, when performed in a hospital under aseptic conditions, have been followed by good results. Because of the difficult and laborious after-treatment of symphyseotomy, the occasional occurrence of hemorrhage from, and infection of the wound, and the frequent lack of firm union of the joint, the operation did not gain much popularity and led to the invention of the open pubiotomy of Gigli, the partial subcutaneous hebosteotomy of Doederlein and the strictly subcutaneous hebosteotomy of Bumm. The division of the bony ring of the pelvis, whether done in the symphysis pubis or

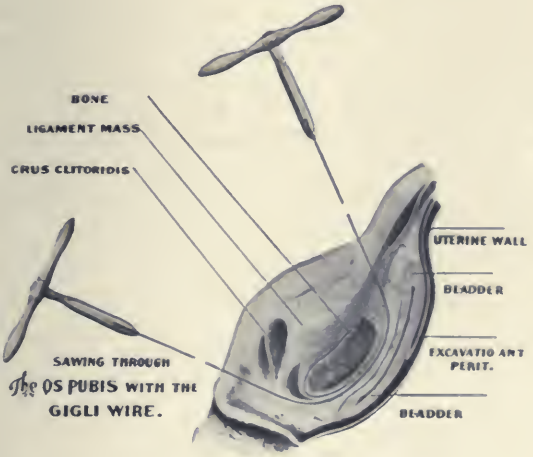
to one side of it, according to the method of Gigli, Doederlein or Bumm, has apparently a very favorable prognosis. Remarkable results have been obtained by it in the hands of Pinard, Zweifel, Kroenig, Bumm and Doederlein who, collectively, record more than 2000 cases of narrow pelves with a mortality of 0.1 per cent. and a fetal mortality of only 6 per cent.

Though symphyseotomy, Gigli's pubiotomy and Doederlein's hebosteotomy are not regarded with much favor in this country, and are even discouraged and denounced by some of our best and foremost obstetricians, it cannot be denied that the results obtained (especially with Doederlein's subcutaneous hebosteotomy) by the authors just mentioned are profoundly impressive and worthy of our most serious consideration.

There is a striking contrast between the opinions expressed on this subject at the last German Gynecological Congress at Dresden, 1907, and the last meeting of the American Gynecological Society at Philadelphia, 1908. In Germany, such men as Doederlein, Zweifel, Kannegiesser, Bumm, Hocheisen, Tandler, Seeligman, Henkel, Sellheim, Buerger, Reifferscheid, Thiess, Fritsch, Gauss, Peham, Hammerchlag and other distinguished writers and operators are enthusiastically in favor of the subcutaneous varieties of disjunction of the pelvis in the treatment of moderately contracted and narrow pelvis. Leopold, opposing hebosteotomy, sought to prove that the same good results can be obtained with the compromise operations; but Baisch showed that Leopold made a mistake in his comparisons and that he erred in the calculation of his statistics. Hofmeier favored Cesarean section; Kuestner, artificial premature labor; E. Bauer warns against too great an application of sectio cæsarea as well as hebosteotomy. A. Breau (Paris) *thinks* that hebosteotomy is as disagreeable in its consequences as symphyseotomy. As far as the speaker is able to determine, those who oppose hebosteotomy have had no personal experience with the operation. In Italy and France, both symphyseotomy and pubiotomy are generally accepted. In these two countries and in Germany the so-called compromise operations—the induction of premature labor, prophylactic version, the high forceps and perforation of the living child—are being gradually eliminated from the therapy of narrow pelvis. But in England, in the United States of America and in Canada the division of the bony ring of the pelvis, whether in the pubic joint or to one side of it, has found little favor and few followers. With the exception of a few of



INSERTION OF THE
PUBIOTOMY NEEDLE



PUBIOTOMY NEEDLE.

ZINKE—HEBOSTEOTOMY. (*After Bumm.*)

the members, the American Gynecological Society, which discussed this subject, condemned symphyseotomy and pubiotomy in unmeasured terms, notwithstanding that Williams, of Baltimore, performed Doederlein's hebosteotomy thirteen times and was well pleased with the result: that Norris, of Philadelphia, and Fry, of Washington, believed there is a place for both operations, and that DeLee, of Chicago, promised to give Doederlein's hebosteotomy a trial.* Grandin, Jewett, Cragin and Murray, of New York, Hirst, of Philadelphia, and Green, of Boston (the latter of whom spoke for all of his colleagues), expressed themselves unqualifiedly against symphyseotomy and pubiotomy under any and all circumstances. They favored the induction of premature labor and, if they did not perform it, would, in "border-line cases," give the patient the benefit of the test of labor" and, if spontaneous labor appeared impossible, resort to high forceps, version and extraction and, if necessary, Cesarean section in preference to symphyseotomy or pubiotomy. At present, all who spoke adversely to these two operations are supported in their opinion by a solid bulwark—the medical profession of this country in general.

There is, however, not the least doubt in my mind that by a strict prophylaxis against infection, the need of the compromise operations can be greatly reduced. In the hospital clinics of continental Europe and in a few instances in this country, these procedures are disappearing from the management of labor complicated with narrow pelvis. Version and manual extraction are always more or less brutal; premature artificial labor is never free from serious danger, and of the high forceps Gusserow long ago aptly said: "They fit the narrow pelvis like the fist of the prizefighter upon his opponent's eye." In spite of antiseptic precautions, the maternal mortality of the high forceps in clean cases remains 4 per cent.; of prophylactic version, 2 per cent.; of premature artificial labor, 5 per cent. The fetal mortality of the high forceps varies from 40 to 50 per cent.; prophylactic version, 25 per cent., and the fetal mortality of premature artificial labor does not fall below these figures (Krull and Baisch). J. Kretschmer (Breslau) states that during the years of 1897, 1898, 1899 and 1900, the frequency of operations as well as the fetal and maternal mortality in cases of narrow pelves was as follows: frequency of operations, 60 per cent.; fetal mor-

*Dr. E. B. Montgomery, of Quincy, Ill., performed successfully the first pubiotomy in this country (1903) for an impacted head in mento-posterior position.

tality, 22.5 per cent.; maternal mortality, 5 per cent. The fetal mortality of the high forceps equals 30.8 per cent.; the fetal mortality of prophylactic version, 33.3 per cent. If, in addition, we consider the damage done to the mother's soft parts, 40 per cent. of cervical and 36 per cent. of perineal lacerations (extensive in character), the dangers of the compromise operations become more apparent.

The latest treatment of narrow pelvis, as now taught and practised in some of the clinics of Germany and France is indeed much more simple, uniform and apparently far less dangerous to both mother and child. It consists of the expectant method (spontaneous labor), of hebosteotomy and (in very rare instances) of Cesarean section. In this country, as already stated, Cesarean section is performed in preference to pubiotomy (hebosteotomy) because the latter operation is regarded as dangerous and unsatisfactory as the symphyseotomy of Galbiatti and Morisani. The speaker unhesitatingly admits that the after-treatment of hebosteotomy demands extra care, but it is not as difficult and laborious as that of symphyseotomy of the past. When we consider that the division of the pelvis does not implicate the peritoneum and the uterus, it certainly is a less dangerous procedure than Cesarean section. Doederlein reports 294 hebosteotomies. In seventy-seven of them the open method (Gigli's) was followed and eight mothers died, 10.4 per cent., in the other 217 cases he pursued his own method and only nine mothers died, 4.1 per cent. Buerger (Vienna) reports 76 per cent. of spontaneous deliveries out of 4,600 labor cases complicated with narrow pelvis. He performed hebosteotomy twenty-one times with uniformly good results for the mother and the loss of two children. Reifferscheid made twenty-seven hebosteotomies with excellent results; one mother died on the fifth day of embolism. Those who have performed hebosteotomy most frequently claim that the danger of hemorrhage and infection is very small, that union of the bone, as a rule, takes place promptly, and when this does not occur, ligamentous union follows, which is a positive advantage because it often renders spontaneous labor possible in subsequent pregnancies and does not interfere with locomotion, and the after-care of the patient is not as difficult as is generally believed. Hebosteotomy should not be condemned before a thorough practical trial is made by skilled and experienced men, preferably in hospitals.

If hebosteotomy proves to be what Doederlein, Zweifel,

Pinard, Kroenig, Bumm, Baisch and others claim for it, then the difficulty of selecting one of the many compromise operations in a given case will cease to exist, and the mental torture and mortification of the obstetrician when, in the absence of success, the question arises—Was the right thing done?—will belong to the past. This will, indeed, be a great relief to the obstetrician when he considers the indefiniteness with which the indications for the compromise operations have been stated by the writers on obstetrics, no two of whom agree.

In Doederlein's clinic, premature labor, the high forceps and prophylactic version have been discarded and his clinic points with pride to the wonderful results obtained by themselves and Zweifel, Pinard and Kroenig with this new treatment of narrow pelvis. When they do not deliver with the forceps or manual extraction in breech or transverse presentations, they wait for spontaneous labor and, in rare instances, when the disproportion between head and pelvis is not too great, enlarge the bony ring by performing hebosteotomy, or, if need be, perform Cesarean section. They are firm in the belief that the old-established treatment of narrow pelvis will become, sooner or later, a thing of the past, and that it is subcutaneous pubiotomy which "gnaws destructively at the foundation of the labyrinthian schoolhouse of indications for the compromise operations." They speak enthusiastically of the marked change in favor of the new therapy of narrow pelvis at the last Gynecological Congress at Dresden, where the magnificent results obtained with Doederlein's hebosteotomy by all operators created a profound impression.

The new therapy of narrow pelvis as suggested by the above authors certainly presents food for serious thought and prolonged reflection. Not so much, perhaps, for physicians who practise obstetrics in hospitals as for the ones who persistently refuse to send labor cases, threatened with complications, to a maternity.

The high forceps, version and extraction, and the induction of premature labor have been and are still favored methods of delivery in cases of narrow pelvis, and in this country especially, this therapy is carried out unhesitatingly in private practice at the patient's home. This accounts for the high maternal and fetal mortality of labor cases associated with narrow pelvis. There are many reputable practitioners who, in every possible way, decry and discourage hospital deliveries, and the majority of those who do not deny that the parturient could be better taken

care of in a hospital, maintain that it is impossible to make hospital deliveries a popular custom. It is impossible to form a correct estimate of the maternal and fetal mortality and morbidity of the treatment of narrow pelvis now in vogue in this country. Abroad, where the records of cases are more strictly kept, the maternal mortality fluctuates between 8 and 10 per cent., the fetal mortality between 30 and 40 per cent. under the old treatment of narrow pelvis.

The results obtained under the new therapy in the thousands of cases of narrow pelvis treated by Doederlein, Zweifel, Pinard and Kroenig, and which show a reduction of the maternal mortality to 0.1 per cent. make a profound, almost startling impression and cannot pass without heed in this country. The waiting for spontaneous labor in the treatment of narrow pelvis is already accepted and practised by many of our obstetricians, but Cesarean section is performed in preference to pubiotomy, and where this is not done, the high forceps, version and extraction, or craniotomy even upon the living child, are still popular procedures when the case has gone to the end of term; or premature labor is resorted to if the case has not advanced that far.

In view of the remarkably good results obtained within recent years by Doederlein's hebosteotomy and the fact that this operation is daily growing in favor with the obstetricians abroad because of its favorable prognosis, it is wrong to reject it solely upon theoretical grounds or for the reason that symphyseotomy or Gigli's pubiotomy were unsatisfactory in our experience in the past. Like Cesarean section, hebosteotomy should be performed, if possible, only in a hospital and by men well trained in the work. For the same reasons we must again express the hope that, before many years, it will be the custom everywhere to send complicated and difficult labor cases, and the parturient who has no proper accommodations at home, to maternity hospitals.

This applies to all cases of prolapsus funis, placenta previa and eclampsia, the therapy of which has also greatly changed since the introduction of antisepsis into midwifery. In these cases, while the conditions and causes vary in character and origin, the principles of treatment remain the same. In the one variety the obstruction lies in the bony pelvis; in the other in the pelvic soft parts.

The mortality of placenta previa (maternal and, especially, the fetal) remains high. Because of the dangerous condition

of the mother the fetal mortality is not generally appreciated by the attendant whose entire attention is occupied with efforts to save the mother. The combined version of Wright and Braxton Hicks; the tampon, followed by version and slow extraction of the child, according to Frey and DeLee; and balloon dilatation (metreurysis) are the preferred methods of treatment at the present time. Though antisepsis has reduced the maternal mortality in these cases to 8 per cent., the fetal mortality, according to the most recent statistics of Zweifel, is enormous, being 70 per cent. Bossi dilatation has not reduced the mortality of either mother or child and records a marked increase in extensive lacerations of the cervix and perineum. Cesarean section, when performed early, under rigorous aseptic precautions, has been successful for both mother and child in quite a number of cases; but this operation is not indicated in placenta previa except when complicated with narrow pelvis, rigidity of the soft parts, or by transverse or complex presentation of the child.

Dührssen's vaginal Cesarean section will, probably, become the preferred operation when the implantation of the placenta is central, or nearly so, and when associated with an unabridged cervix or rigid os and an ample pelvis. Vaginal hysterotomy, when more generally known and better understood, will displace all compromise operations, including metal and balloon dilatation, indeed, all methods of delivery falling under the head of *accouchement forcé*.

In eclampsia, as in placenta previa, the obstetrician's efforts to save the mother overshadow all considerations for the child. While the speaker is convinced that the physician can do more to avoid this frightful obstetric complication by way of prophylaxis during gestation and, medicinally, when the disease first begins to manifest itself, than by any operative intervention when convulsions prevail, and that the time has not yet arrived when one can say with degree of certainty that *this* or *that* operation will save the mother, he repeats that he is convinced that, if an operation is to be performed and the indications for Cesarean section are not sufficiently definite, vaginal hysterotomy is the gentlest, quickest and most promising procedure for both mother and child. All compromise operations, metal and balloon dilatation, and Cesarean section, in the presence of an ample pelvis and child not abnormally developed, cannot be compared for safety to vaginal hysterotomy in case of eclampsia.

Baisch, who is supported in his opinion by Bumm and Kroenig,

says of Dührssen's operation: "The rapidity with which the uterus is opened, the opportunity of observing every phase of labor, the certainty and precision with which hemorrhage can be arrested and the wound taken care of, the smooth and easily recognized and readily accessible incision, are advantages which elevate vaginal Cesarean section far above balloon and metal dilatation," and for evident reasons above all compromise operations and even abdominal Cesarean section.

Everything considered, it would appear that the time has come when the expectant spontaneous labor, hebosteotomy and, in very rare instances, Cesarean section will take the place of craniotomy, induction of premature labor, prophylactic version and the high forceps in the treatment of narrow or contracted pelvis. The thousands of cases thus far treated with the new therapy show that spontaneous labor occurs in about 80 per cent. with the mother uninjured and the child living; 15 per cent. being delivered with the aid of hebosteotomy and 5 per cent. by Cesarean section. These magnificent results prove the wisdom of the expectant treatment of narrow pelvis; and hebosteotomy and Dührssens operation, while done in the interest of the child, are strictly scientific and practical, as well as gentle operations, and are of a life-saving character for the mother. Let us hope that the large number of compromise operations, including balloon and metal dilatation, will be abandoned for the *expectant* or *spontaneous* method and the two complete operations with definite indications—*hebosteotomy* and *Cesarean section. Vaginal hysterotomy* will take the place of accouchement forcé, the repeated application of the tampon and of balloon and metal dilatation.

The compromise procedures should be limited entirely to cases in which infection has occurred. The presence of sepsis excludes hebosteotomy and especially Cesarean section from the management of cases. The achievements of recent years find no application in septic cases and the field of usefulness of hebosteotomy, vaginal hysterotomy and Cesarean section should be limited to hospitals entirely if possible.

For years the speaker has ardently and persistently advocated that pregnant women, victims of conditions indicative of possible labor complications, or whose homes are ill-suited for parturition, should be taken to a hospital for delivery. Some good has been accomplished; but the majority of general practitioners of the city, as well as of the country, do not look upon the proposal with favor. Yet the seeds which have been sown would, at an

early date, bear abundant fruit if teachers of obstetrics would advocate hospital deliveries and proclaim the fact that this is the only way in which the mortality and morbidity of midwifery can be further reduced.

Not so many years ago a hard battle was fought against the custom of performing abdominal operations in private houses. The abdominal surgeon who precipitated the fight, was victorious and, as a direct consequence, abdominal surgery developed to an extent not expected by even the best and most hopeful operators in that department of surgery. As then, so now! The problem of midwifery will not be solved until sepsis can be avoided in every case of pregnancy, labor and confinement, and, until all women pregnant, who are threatened with prolonged and difficult labor from any cause, shall be taken to a hospital for the purpose of confinement.

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For Discussion. See page 198.

ARTERIOSCLEROSIS OF THE UTERUS.

BY

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UNDER the foregoing title I desire to invite attention to a pathological change in the walls of the uterine arteries, which is an etiological factor in profuse uncontrollable hemorrhage from the uterus of greater clinical importance than has generally been observed. The recital of a case which came under my care together with two others I have been able to collect will, I trust, serve to illustrate the value of the subject under discussion.

CASE I.—Mrs. K., fifty years of age, mother of five children; general health had always been good, her appearance being that of a well-preserved woman of her age. Menstruation was regular and normal in all respects, but ceased abruptly at forty-five years of age. One year after entire absence of menstruation bleeding from the uterus appeared at irregular intervals of three or four months, lasting three or four days, and at times was quite free. For three months previous to her first visit to me, hemorrhages from the uterus had been very free, coming several times during the month, and rarely being entirely absent. She had lost in a few months, and rapidly in flesh and strength, and was much alarmed over her condition.

Examination of her pelvis was made and the uterus found to be movable, slightly enlarged, with a bloody discharge from the os, but without the odor which suggests malignancy. The cervix was rather hard, and no tumor was found in her pelvis. With the clinical evidences so marked at her age, a radical operation was advised, for which her consent was readily given. Examination found her heart and lungs normal, with the radial pulse soft and elastic. Examination of the urine was normal. Operation for hysterectomy was made through the abdomen. When the uterus was grasped it gave the impression of being unusually hard, and the tortuosity and prominence of the uterine arteries and their branches at once attracted attention as most uncommon. When an attempt was made to ligate the arteries I found them so brittle they would not support a ligature, and when an

artery was grasped with hemostatic pliers a segment of the vessel would come away in the bite of the forceps. Hemorrhage was enormous and it was with great difficulty that it was only partially controlled, dependence being largely on firm packing with strips of gauze. The operation was prolonged, and the patient left the table anemic to a degree, and in the most profound shock. Intravenous injections with normal salt solution were given; and though every possible expedient to bring about reaction was resorted to, she died within two hours from the beginning of the operation. I regret that this specimen was carelessly misplaced, and that a microscopical examination was not made. However, the macroscopic findings were such as to practically demonstrate the facts. The uterus was hard, and the blood-vessels gave the impression of segments of a chalky tube held together by an outer coating of elastic fiber, so extensively infiltrated were all the arterial coats with calcareous deposits. (This case I reported briefly before the S. C. Medical Association in April, 1907.)

Case II.—A patient of Dr. Robert S. Cathcart, of Charleston, S. C., is of interest, and Dr. Cathcart has kindly given me all the facts connected with the case. Mrs. B., age forty-four, married at twenty-three years, two children at term; one miscarriage of twins at five months; more or less difficult and painful menstruation, until after the birth of her children, when this function became normal. She was a large generally well-nourished woman. In June, 1907, there was a free hemorrhage from the uterus which lasted a good many days, and could not be controlled by any ordinary measures. She consulted a physician in a neighboring town, who gave as his opinion that there was a cancer of the uterus. This diagnosis was not accepted by the patient's husband who is a physician. The patient was then taken to Dr. Howard A. Kelly, of Baltimore, who made a careful study of her case, and determined that there was no evidence of cancer of the uterus. She was treated by Dr. Kelly, and returned to her home, with the advice—should the hemorrhage reappear, to return to Baltimore prepared to have a radical operation made for the removal of the uterus.

After treatment in Baltimore, though her general health was better, bleeding from the uterus continued irregularly, sometimes at intervals of only seven days, lasting for a couple of days, and again with periods of complete absence for as long as three months. In November, there was a free hemorrhage from the

uterus which lasted three weeks. For this a curetment was done, giving temporary relief. In December bleeding reappeared, was free, lasted about a month, and could not be controlled. This continued with intervals of only a day or two of cessation, and resisted every known means of treatment for its control until February 25, 1908, when Dr. Cathcart was called to see the patient at her home about one hundred miles from Charleston. He found her anemic and exhausted from loss of blood. He was able to control the hemorrhage by firmly packing the uterus with strips of gauze, and advised her removal to an infirmary in Charleston.

The patient was prepared two days later for operation. At the beginning of the operation the uterus was curetted, and a section taken from the cervix. Both specimens were given for immediate microscopical examination to a pathologist who reported in a few minutes that they were not malignant. Her abdomen was then opened for hysterectomy. The uterus was slightly enlarged and firm. The uterine and ovarian arteries were prominent and tortuous. Hysterectomy was completed without difficulty, and the patient made an easy recovery. Sections for microscopical examination of this uterus were taken by Dr. George McF. Mood. He reported no evidence of cancer, but fibrous changes in all the arteries. I have neglected to mention at the beginning of this report that there was no evidence of a general arteriosclerosis.

CASE III.—This closely resembles the one recited above, and need not be repeated here. It has been placed upon record in a very complete and interesting article—"Arteriosclerosis of the Uterus," by Dr. Robert S. Slocum, of Wilmington, N. C. His article appeared in the April, 1908, number of *Surgery, Gynecology and Obstetrics*. In the May, 1907, number of the above journal Dr. T. J. Watkins, of Chicago, exhibited a specimen of arteriosclerosis of the uterus before the Chicago Gynecological Society, and made a brief report of this disease, emphasizing the necessity for hysterectomy, whether or not malignancy is found, on account of the great danger of not getting the right specimen, and of the great probability of the uterus becoming malignant, if it is not already so. Except in one of the volumes of Operative Gynecology by Dr. Kelly, where arteriosclerosis is given as one of the causes of hemorrhage, it is not mentioned in any of the text-books devoted to diseases of women, I have had access to.

For the cause of arteriosclerosis I quote briefly from Dr.

Osler's Practice of Medicine: "Physiological arteriosclerosis depends in the first place upon the quality of arterial tissue (vital rubber) the individual has inherited, and secondarily upon the amount of wear and tear to which he has subjected it. Overwork of the muscles, by increasing the peripheral resistance and by raising the blood-pressure is a potent factor."

When we recall the muscular arrangement of the uterus, and remember the fact that this organ is subjected to the most radical structural changes during the life of a child-bearing woman of any organ in her body, offering at one time resistance to the blood-supply, and again relaxation which admits of easy access of blood, the arteries alternately dilating and contracting, and with this process more or less frequently repeated, truly a condition is obtained, which is most favorable for the development of a localized physiologic arteriosclerosis. In a fair proportion of cases this physiological change degenerates into a pathological one. The sclerosed arteries become so weak that they are no longer capable of standing the blood-pressure, and give away with hemorrhages from the uterus, which may be sufficient to cause the death of the woman, and certainly to so deplete her that permanent invalidism is produced. Curetment, in arteriosclerosis of the uterus, except for its immediate effect (and this is very temporary), increases the liability to hemorrhage. All preparations of ergot increase the bleeding by raising the arterial tension of the inelastic vessels.

In a paper by Dr. Frank F. Simpson, of Pittsburg, Pa., "Unusual Dilatation of Cornual Bloodvessels," read at the 1905 meeting of this Association in New York, he states that sclerosis (referring to the uterine arteries) in its several forms is found varying from a slight nodular infiltation of the intima to complete obliteration of the vessel. Dr. Simpson has also observed cases of arteriosclerosis where the uterine vessels were accompanied by menorrhagia, and metrorrhagia which began between the ages of 38 and 45 years of age. They grew more and more pronounced, resisting all medical and minor surgical measures, finally endangered life, and yielded only to hysterectomy. In an abstract from *Surgery, Gynecology and Obstetrics*, Sept., 1906, vol. iii, by Dr. Kurt Wittek (Sclerotic Changes in the Vessels of the Uterus and the Climacteric Hemorrhage), Cruveillier and Rokitansky are mentioned as the first to report such cases, to which Cruveillier gave the name of apoplexis uteri. Klof, Wincke, Martin and Vail are spoken of as calling attention to the

subject. Scanzoni, in 1859, and later, Corneil, 1889, emphasized the fact that rigid and brittle vessel-walls with a thickening of the uterus from sclerotic arteries was a definite cause of hemorrhage. In the January, 1907, number of *Surgery, Gynecology and Obstetrics*, Dr. Ostrom, of New York, in discussing the propriety of removing the uterus for nonmalignant diseases, refers to arteriosclerosis of the uterus as a rare disease, and one but recently differentiated, that it closely resembles metrorrhagia myopathica, but differs especially in the hypoplastic changes in the media and adventitious coats of the vessels, which reduce their contractile power and favor capillary hemorrhage. He further states it is impossible to say that the pathology will long be confined to the bloodvessels and with this uncertainty, if the disease cannot be cured by other means of treatment, curetment, and the like, removal of the uterus is justified.

In conclusion I desire to emphasize the following facts:

First, that a diagnosis of arteriosclerosis of the uterus is difficult to make, and can only be made where it is possible to exclude every other cause of hemorrhage from the uterus, and by microscopical examination of scrapings from the uterus, in which sclerosed capillaries are found, or finally from sections of such a uterus after its removal.

Second, arteriosclerosis, as a definite cause of hemorrhage from the uterus, occurring in women between the ages of 40 and 50 and among those who have borne children, is of greater importance than has generally been determined.

Third, that in a fair proportion of cases the hemorrhages from the uterus are in themselves sufficient to endanger the life of a woman, and can be made to yield only to hysterectomy.

Fourth, that, with the uncertainty of diagnosis even after examinations of a section from the cervix and scrapings from the uterus, which show no evidence of malignancy, in women between the ages of 40 and 50 who have born children, and suffer with frequently recurring hemorrhages, hysterectomy is justified.

DISCUSSION.

Dr. C. C. Frederick, Buffalo.—The paper has interested me because it has explained some of the cases I have seen recently, especial y cases of persistent bleeding, where there was not much enlargement of the uterus; no evidence of any fibroid growth; no evidence from the scrapings of any intrauterine growths or degenerative changes, carcinoma, or the like, where curettage was only temporary in its beneficial results, cases with

more or less oozing, at all times, very seldom with any amelioration by anything that was done for the patient. I have seen eight or ten of these cases in the last four or five years; how many I saw before that time I do not know. They had been curetted by Smith, Jones and Brown for a period o several years, gradually getting worse; more or less anemic, and still flowing, flowing, flowing.

The first case I operated by hysterectomy eight or ten years ago nearly died, as did the first case related by the essayist, from the brittle arteries bleeding and bleeding, with almost actual inability to control the hemorrhage I did the operation through the vagina. My custom in doing hysterectomies, where there is a roomy vagina, when the woman has not passed the menopause, and vagina is not contracted, is to do them by the vagina, if possible. As I have said, I did it through the vagina and tried to do a suture operation, but therein I made a mistake. I had to open this woman from above, and finally held the parts by clamps passed through the vagina, drawing up the broad ligament and putting on clamps there. I found that the clamp operation was suitable for these cases. Since that time I have operated upon eight or ten patients by the clamp operation through the vagina. These clamps will hold. You crush right down on the bloodvessels and hold them for forty-eight or seventy-two hours with the clamp, and you have no trouble at the time of the operation. I would therefore advise that the operation be done by the clamp method either through the vagina or through the abdomen; but through the vagina the operation is much easier, shorter, and there is much less shock, and when the uterus is not too much enlarged I would advise that the operation be always done in that manner. If you do the operation with the ligature you get into deep water. There is nothing but hysterectomy for this class of cases.

Dr. Hugo O. Pantzer, Indianapolis.—The significance of this subject and its importance have been very clearly set forth in this paper. The localized occurrence of atheroma or sclerosis of the uterine arteries was described by Virchow, quoted in a late edition of Schroeder, as pertaining to an individual in the twenties who had had but one pregnancy, involution having been followed by the usual changes.

The frequency of this affection is much greater than is commonly accepted, and there is no doubt that many of these cases are operative as representing cancer. At any rate, a diagnosis of cancer is likely to be made in some of these cases; but all of them do not necessarily lead to a fatal issue. I do not question the advisability of operating on these patients, but I have in mind one woman who would not submit to an operation, and who even after profuse hemorrhages became entirely well.

Regarding the method of procedure, I should invariably prefer the abdominal route. In one instance I tried to apply a clamp to one of the uterine arteries six or seven times, and

found it very difficult to control hemorrhage. On that account I should feel some hesitancy in using clamps in these cases in the future. I should think in the cases just mentioned the use of the clamp would have been followed invariably by hemorrhages. The removal of the clamp afterward would likely have caused a new hemorrhage or a new break in the vessels.

Dr. Frederick Blume, Pittsburg.—I rise to confirm what Dr. Frederick has said with reference to the removal of the uterus through the vagina. Arteriosclerosis of the uterus is better understood to-day than it was twenty-five years ago. At that time curetment and cauterization done upon these patients did not relieve them and they often went from one operator to the other. The diagnosis in these cases is not always clear, some form of endometritis or a malignant disease of the uterine body first being thought of, until the microscope reveals the true nature.

Conservative operations, in my experience, are not curative in these cases. I have operated on three patients the last two years and on six or eight within the past five years, doing vaginal hysterectomy by the use of the clamps. Such an operation can be done in uncomplicated cases in fifteen minutes, and this is of great importance, especially in fleshy women who, having lost a great deal of blood in the course of the disease, cannot stand much surgery. One of my patients, forty years of age, with a large uterus and badly lacerated and eroded cervix, had hemorrhage for almost half a year, and it looked like a beginning carcinoma of the vaginal portion. Microscopical examination proved it to be a case of diseased uterine vessels. I curetted the womb, amputated the cervix, and the patient did well for severa weeks, when she had an alarming hemorrhage. I had the same experience with two other patients, who, a few months after curettage and cauterization, again complained of hemorrhage until vaginal hysterectomy relieved them.

Dr. John A. Lyons, Chicago.—I want to relate a case that came into my hands after the patient had been under observation by three prominent practitioners. This case occurred about sixteen years ago, at which time arteriosclerosis of the uterus was not well understood. The patient had been in St. Luke's Hospital, and rather than remove her uterus, which had been determined upon I thought I would try the use of electricity, which at that time was very much in vogue. In this case I got a most excellent result, although the uterus was hard and nearly normal in size and at least simulating this disease. Electricity at that time, you will remember, was used for reducing fibroid tumors and in overcoming or controlling hemorrhage from fibroids. But this uterus as I now recall it was not enlarged and was undoubtedly a case of threatened arteriosclerosis in which to my surprise the hemorrhage ceased following the use of electricity, which seemed to tone what little elastic fiber the arteries had, and the patient did very well after that I had the woman under

observation and general treatment for probably a year thereafter, she had no further serious hemorrhages. Therefore, before hysterectomy is performed, I think it is well to try electricity, at least where an early diagnosis is made. This patient had been curetted by one or two well-known gynecologists without result.

Dr. Frederick.—How strong a current would you use, and for how long a period of time?

Dr. Lyons.—Forty or more milliamperes, and from five to ten minutes at a time?

Dr. Frederick.—How long did you use this treatment?

Dr. Lyons.—My recollection is the patient recovered within a month from the hemorrhage. I would not say positively that electricity will control the hemorrhage in many cases of arteriosclerosis. This patient, however, had been at St. Luke's Hospital for hysterectomy, and at that time refused to be operated on. She was there under the care of a prominent gynecologist, who came to the conclusion that about the only thing that would stop the hemorrhage in her case and save her life was a hysterectomy, which is true in most cases. She, however, left the hospital, and later came under my observation. I knew of the case while she was in the hands of another practitioner, and I was very much surprised to get such an excellent result by this means, for I did not expect it.

Dr. Skeel.—I would like to ask Dr. Lyons on what he based his diagnosis of arteriosclerosis in this case, inasmuch as the uterus was not removed.

Dr. Lyons.—I am surmising very largely that it was a case of arteriosclerosis of the uterus, principally from its clinical history. There was no malignancy in the case, neither was it a fibroid, and it stands in the same relation as those reported by the essayist.

Dr. Charles Greene Cumston, Boston.—The subject of arteriosclerosis of the uterus is very interesting, and I would first like to ask Dr. Rees if an autopsy was made on the first case.

Dr. Rees.—No.

Dr. Cumston.—Some years ago in a discussion before this Association the question of uterine hemorrhage was up, and I pointed out at that time that we occasionally met with it in chronic Bright's disease, and that inasmuch as we have sclerosis of the kidney, there is no reason why we should not have a similar arteriosclerotic condition in the uterus. Some years ago I wrote a paper entitled, "Hemorrhagic Metritis." In that paper I set forth the pathologic findings, which were chiefly those of arteriosclerosis of the small vessels and muscular elements of the uterine parenchyma; in other words, a general sclerosis of the uterus. I advised and practised at the time I wrote that paper (I do not recall where the paper was published) vaginal hysterectomy, and at the society where I read the paper I was rather vigorously criticised as being too radical. Since then, however, I have had several other cases in which I have found the uterus somewhat enlarged, movable, with apparently no lesion in the adnexa,

and I have operated purely for uncontrollable hemorrhage if curetment was insufficient. In these cases a diagnosis of arteriosclerosis of the uterus can be made if after a thorough curetment the endometrium is examined and found normal, as it usually is, the lesions being confined to the parenchyma itself. If the hemorrhage continues after regeneration of the endometrium, I believe it is the proper procedure to perform immediately vaginal, and not abdominal, hysterectomy. I am unaware of any case that has ever been reported where the lesions were as marked in the uterine arteries as in the case reported by Dr. Rees, but it would seem to me that even then, given a pipe-stem uterine artery, with a good pair of clamps, with a good hold on the broad ligament, it would be very hard for a vessel to get away from that grip.

Dr. Albert Goldspohn, Chicago.—The essayist has said that the diagnosis of arteriosclerosis of the uterus is difficult to make; consequently there is danger that we may treat some cases on an incorrect diagnosis. But actual cases of arteriosclerosis of the uterus should be treated by hysterectomy, and nothing else. I simply rose, however, not to say anything about the diagnosis or the pathology nor the indications for treatment, but to speak with reference to the technic of hysterectomy. In such cases, like many other uteri that are useless, the uterus, as a rule, should be removed by the vagina. Vaginal hysterectomy seems to be going back a little too much. It is only about five years when the pendulum swung the other way, when we were trying to do a goodly number of laparotomies for conservative, reconstructive treatment through the vagina. That was a mistake, but it is also a mistake to resort to the abdominal route for such simple cases as these.

With reference to the use of clamps, it is true the ligature is dangerous to meddle with, and that some kind of clamp is needed that will be speedy and safe. But there is a very unfortunate feature connected with the clamp. It means that where extirpation of the uterus has to be done with the aid of clamps, following it a lot of gauze is stuffed in, which is not an innocent thing in the peritoneal cavity, and inasmuch as we do not leave such a foreign body when we invade the peritoneum through other directions, for the same reason we should avoid using such a foreign body in the pelvis. It necessitates the agglutination to each other of healthy knuckles of small intestine, which become frequently permanently anchored in that abnormal region. The studies of the late Dr. Nicholas Senn, undertaken many years ago, proved to us that it is the destiny of the small intestine to travel; we may put a ligature on it at one place, and in ten days we find it in an entirely different part of the abdomen. If we use a lot of gauze in these cases which is likely to cause agglutination of the small intestines at some point in the pelvis, it is destined at some future date to be in some other part of the body, leading eventually in a number

of cases to interference with the pelvis, with the abdomen, vague pains of which no one knows the origin, and once in a while to ileus, which may prove fatal if relief is not given.

It has fallen to my lot in years gone by to have to do abdominal section three times for a very serious condition of this kind—namely, to relieve an intestinal obstruction. In one instance it followed vaginal work done by myself and in the two other cases it followed the work of other surgeons. This should be avoided. The peritoneum as a closing membrane of the peritoneal sac ought to be united by sutures in all cases of vaginal hysterectomy where sepsis or extensive adhesions are not present, where drainage is not actually needed. This closure of the peritoneum you cannot well do if you use clamps, which you have to guard generally by the introduction of gauze. This difficulty I have found can be very nicely overcome by the use of the Downes electric angiotribe or clamp, an instrument which has been advised by strong men in abdominal surgery, where I have thought it was of no particular advantage, but for the vaginal removal of the uterus I think the angiotribe is a fine thing. We can get the clamp effect and yet not have to look after the forceps, which will do away with considerable inconvenience for the patient, and we can close the peritoneal cavity likewise.

HYSTERIA AS THE SURGEON SEES IT.

BY

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It was my good fortune twenty-eight or twenty nine years ago to spend some time in the Hospital for the Ruptured and Crippled in New York. In the nature of things, many cases of nervous disease came there for treatment, and I had a good opportunity to learn something in this line. Among the neurotics who came to this immense clinic were many hysterics, and the opportunity was afforded me to see and study every variety of the many manifestations of this curious disease.

In all institutions of the kind mentioned above a rivalry in diagnosis exists among the medical staff, and one must be on his guard constantly or be deceived by some catch case. This training has been of the greatest value to me in my private practice, and some of the "biggest hits" I have ever made have been in correct diagnosis and rapid cure of hysterical cases, and it is to relate some of these that I write this short paper.

I have been able to find very little of a practical nature in the literature of the subject. It is only facts, the result of personal experience with the treatment employed, that I propose to give in the relation of the following cases. The cure of these people, whose cases I will relate, was, I think, the result of suggestion, though something must be done, as a rule, to impress the patient with the fact that the doctor is "boss" and of all things if one would succeed he must be sure of his diagnosis. The best method of impressing the patient is the "white-hot iron," best applied along the spine, though hot water douching, fly-blistering, good spanking, sometimes even a good "cussing" will often serve the purpose. By all means gain the cooperation of the friends. Hysterics are all tyrants and will stand more waiting on and attention from those about them than any other class of neurotics. They are absolutely selfish, and oftentimes otherwise perfectly curable cases are never cured because of the foolish indulgence of the family and friends. I will now relate the cases illustrating what I mean by the title of this paper.

CASE I.—Dan H., aged thirteen years. About fifteen years ago I was called to New Albany, Indiana, to see this boy, who from my own knowledge came of a very neurotic family. His eldest brother was killed in early manhood by accident, having given distinct evidence of a neurotic temperament, and his next older brother was the subject of Saint Vitus's dance. This neurotic temperament came from his father's side, his mother being a very phlegmatic woman.

The history obtained was that this boy had been sick for over a year, and in that time there had been in attendance some eight or ten physicians; he had been treated for hip-disease, white swelling of the knee, osteomyelitis of the femur and osteomyelitis of the tibia. I found the boy dressed in a nightgown with a string tied around the waist, no other clothing whatever, lying on his face on the floor reading a book. A glance at the title of the book showed me that it was decidedly beyond his age. Upon making an effort to examine his limb he objected strenuously, and on being asked what was the matter with him he said that he had "electricity" in his leg. I then examined him by force and found the left lower extremity swollen out of all proportion, fully twice the size of its fellow, though the boy weighed about 159 pounds. The circulation seemed to be modified, his limb was blue, and goosefleshy or mottled in appearance. The foot was as much swollen as the rest of the limb, the swelling extending fully up to the buttock.

The whole picture to my mind was that of a neurosis, and I was at once convinced that this boy was a hysteric. I took the mother aside and told her my opinion, asked her if she would cooperate with me in anything I proposed to do, telling her at the same time if she would I felt sure the boy could be cured. She said positively that she would do anything I advised. I then went back into the room and immediately told the boy that I was going to cure him. He laughed and said that "Better doctors than you have tried that," and exhibited the vainglorioussness that these patients in my experience always have, thus further convincing me of the neurotic nature of the trouble. I then wrote a prescription and told the mother she would get with it a large thickly spread fly-blister, that she was to sponge off the boy's back between the hips that night, apply the blister and bandage it on snugly, that in the morning she was to pull it off with a jerk that a large bleb would follow which she was to rip open with scissors and apply a greased cloth, and that Dan would be well.

I then remarked that I would be back 48 hours afterward and if Dan was not well I would bring an iron that I used to burn such people, and that I was sure after he was burned he would be cured.

I returned 48 hours later and the mother met me at the door with a smile. When I asked how the boy was she replied, "He is all right, he has been at work in the mill since the day after you were here, doctor." I asked her if the swelling had disappeared from the leg and she said, "Yes, entirely."

This boy afterward attended preparatory school, then went to college, and is now professor of Latin and Greek in one of the universities of Indiana. Whenever he would mention, after my first visit, that the "electricity" was coming back in his leg, his mother would say, "Well, we will send for Doctor Vance and he will cure it for you again." This was always effectual in bringing about relief from the symptoms.

CASE II.—H. H., a boy aged ten years. The history obtained was that for ten days he had absolutely refused to walk. Upon thorough examination I could find no real trouble and told the mother that I thought it was a case of hysteria in the male, and in the presence of the boy said I would come back the next morning, that if he was not then up walking about I would burn his back with a white-hot iron which I used in such cases, and I was sure that would relieve him. I went back the next day and found the boy had been up since the afternoon before, that he was perfectly well, and has remained so ever since.

This illustrates the effect of simple suggestion without anything actively being done at all, and in ordinary cases, not of long standing, this is usually effectual.

CASE III.—Miss L. W., a well-developed girl of sixteen years, seen in consultation with Dr. Ouchterlony, of Louisville, who stated that he had a case of aggravated hip-disease which he wished me to see. I obtained the history that some weeks before the girl sustained a slight injury by falling from a tree, though little attention had been paid to it. Later, however, she apparently developed hip-disease in an exaggerated form. When walking about she would come down on the affected limb almost to a sitting posture.

On making an examination I could find none of the signs of any real joint lesion and was convinced that it was a case of hysteria following slight injury, and recommended and immediately applied the actual cautery to her spine. This was about twelve

o'clock in the day. That afternoon she was able to walk about the halls of the infirmary without limping or showing any evidence whatever of the hip-disease that had been supposed present.

Two years later I was again called to see this girl, and on that occasion she looked as if she was going to give birth to twins! Her abdomen was enormously swollen and she was wearing a "Mother Hubbard." I looked her over and found that she had simply a tremendous distention of the intestines. I examined her back and found a tender spot about opposite the tips of the scapulæ. I applied the cautery again that afternoon, the abdominal swelling was absolutely gone within a few hours and she was able to dress in her usual clothes, including a corset! I have seen this girl a number of times since within the last ten years and she has never had any further hysterical manifestations whatever.

CASE IV.—A German girl, twenty-one years of age, seen at the Saints Mary and Elizabeth Hospital, Louisville. She had a decided lateral curvature and was the subject of hysteroepileptic seizures. I made the diagnosis of hysterical spinal curvature, and as a suggestion applied a special corset which held her up perfectly, and while she was wearing it the curvature was overcome. One day as I went into the ward I found she was having one of these hysteroepileptic seizures. She was lying on the bed with only her heels and head touching it—pseudo-opisthotonos—and a lot of women around sympathizing with her. Without any comment I stepped up to the bed, turned her over and spanked her on the buttocks three or four times. She immediately recovered and has thanked me many times since for having cured her.

I take it that the anger and shame induced by this procedure brought about relaxation and took her mind for the time being off her condition. This girl gave evidence of the self-importance that the majority of these patients have; that is, the evident feeling that she was a curiosity or an interesting subject to the medical profession, which, as already stated, is a constant element in the mental part of these conditions.

CASE V.—This is a very remarkable example illustrating this functional mental disease. The patient was a beautiful girl, twenty-three years of age, who came from a distant city to visit a relative in Louisville. At his suggestion she consulted me in regard to supposed disease of the left knee. The history was that when thirteen years of age she sustained a slight injury to

her left knee for which her doctor applied a plaster-of-Paris dressing. This was worn for a few weeks, and at the suggestion of her physician she had made an apparatus for extension of the lower limb, which reached from above the umbilicus to the foot. She had worn this for over nine years. She came into my office on two crutches and appeared to walk with great difficulty, holding the affected limb in front of her. After considerable trouble, I succeeded in getting her on the operating-table in a sitting posture, when she commenced to unbuckle the apparatus. When it was, with great care, removed by her, I began gently to examine her. She cried out as if it caused her excruciating pain. Inspection of the limb showed it to be atrophied to the last degree, looking very much like an infantile paralytic limb. The foot was in complete equinus and the knee in recurvatum. I then adopted new tactics and began plying her with questions as rapidly as I could, succeeding in momentarily getting her mind off her trouble, during which interval I handled the limb with considerable roughness which elicited no complaint. I made up my mind that there was nothing the matter with the girl organically and told her so. She was a very intelligent girl and my conclusion struck her with such horror that she burst out crying and became very angry. I told her I was sorry, but such was my belief, and that if she would allow me to cut off the brace and would follow my directions I would try to relieve the condition. She was very angry and continued to sob and taxed me with cruelty, general heartlessness and the like. It happened that it was about my luncheon time, and I told her while I was getting my lunch she could remain and talk the matter over with her friends and I would be back in the office in a few minutes. In about half an hour I returned and found her still crying and still angry. I then reiterated my statement that the whole thing was nervous, that if she tried she could walk and assured her that her cousin and myself would prevent her falling or otherwise injuring herself if she would try. She thought for a moment and then said she would make the effort. She carefully slipped off the operating-table, with myself on one side and her cousin on the other, and walked across the room once or twice.

There was immediately a revulsion of feeling, and then and there she became convinced that I was right. Whereupon the mental cure was complete. She allowed me to remove the brace from the shoe, and I directed her to let this limb hang over the end of the sofa while lying down and to place a pillow under

the knee while in bed. She went to the country and remained a month on a visit to her relatives. At the end of that time she was walking perfectly well on the limb. Shortly thereafter she returned to her distant home and has been perfectly well ever since.

CASE VI.—Doctor P., aged twenty-five years, who is now a distinguished specialist in a western city, suffered a slight sprain of the knee. There was no evidence of any organic injury whatever. This case was very similar to the foregoing (No. 5) except of shorter duration. I simply gave him a good round "cussing"; he left his crutches with me, walked off and became perfectly well. This example shows how completely the effect of mind over matter may become even in one educated in matters medical and who should know better.

CASE VII.—A sister of charity, aged twenty-five years, had complete club-foot, talipes equinovarus, due to hysterical contracture. This contracture came on suddenly and was absolutely resistful to manual force. The treatment in this case was simply the application of actual cautery to the spine, and the woman walked perfectly well after the first application. However, it was repeated, as is often done, to make the impression lasting.

CASE VIII.—Miss G., sister of a doctor. This doctor came to me and asked me to go to a town a hundred miles distant to see his sister, that she had been confined to her bed for six months and had worn out the family as well as all the neighbors nursing her, that she thought she was dying and would not get out of bed. I told him I would not go to see her, but if he would bring her to me I would cure her! Several weeks after he first consulted me, he again called and asked me to go to the St. Joseph Infirmary, that his sister was there, having been brought from her home on a cot.

I went to the infirmary and walked into the ward where I found a very comely young woman, rosy cheeked and otherwise looking very well, lying on her back in bed. I remarked, "You do not look sick to me"; her reply was, "But, yes, I am; I cannot do anything." I then asked her to turn over on her face, and she replied that she could not do so. Without any further comment, I took her by the hips and jerked her over on her back, saying to her, "The devil you can't," and immediately told the nurse to remove her from the ward where there were too many old women sympathizers, to take her to a room in the infirmary and I would burn her back from the nape of the neck down. The

next day when I called she was up and able to walk about the halls by holding to the wall, muscular weakness from long confinement making this necessary. In three or four days she was walking about everywhere and has since been well.

Case IX.—Margaret M., fourteen years of age. I saw her at the St. Joseph Infirmary, in Louisville, with Doctor Clark, of Lexington, Ky. The history I obtained was that a year previously, when the child was thirteen years old, her left leg "drew up." I found on examination that the thigh was flexed upon the abdomen and the leg upon the thigh, and that with a great amount of force no impression could be made in the matter of extending either. When the trouble was first noticed the girl was placed in an infirmary under the care of Dr. Clark, who endeavored to treat her by isolation. However, this isolation did not amount to much because her room was constantly filled with young men and women attaches of the hospital. Her mother, also a neurotic, would send her all the trashy French novels she could get and write her forty-page letters full of nonsense.

When I was called into the case I said I would take charge of it only on condition that her mother kept away from her entirely. This she failed to do. I worried along for a week, but failed to gain any control of the patient, as the mother was constantly writing her long letters and also sending her reading matter of the character mentioned above. The mother then, upon my strenuous objection to her continuing near the girl, left her entirely alone. Under an anesthetic I easily extended the limb and applied a plaster-of-Paris dressing, which remained on three days. This was done simply as a matter of suggestion. I then, while alone with the girl, started to cut the plaster dressing off. After a section had been made the full length and I was pressing it open in order to remove it, the girl cried, "It is going to draw up; it is going to draw up"; at which I very sternly said, at the same time shaking my fist in her face, "If it does draw up, I will break your d—d little neck." The limb did not draw up, and the child was cured.

Before returning to her home she confessed to me that every effort of her mind and soul had been directed toward making useless everything I did until I gave her that "cussing."

Case X.—This was a very interesting case in the person of a sister of charity. I was called to the Saints Mary and Elizabeth Hospital to see a woman, thirty-five years of age, who gave the

history of having had her ovaries removed two years previously, at which time she came near dying from hemorrhage. She made an extremely slow convalescence and had never recovered sufficiently to get out of bed. I found on examination that she was completely paralyzed and was totally blind. She had been examined by two oculists who told her she had a brain tumor and advised sending for me to see if I could not cut it out!

I recognized the woman as one whom I had seen eight years previously and treated for hysteria by burning her back. When I saw her this time she was lying there absolutely paralyzed and totally blind, being fed by the sisters with a spoon; she could not move either hands or legs and would let one touch her conjunctivæ without any complaint. I made up my mind it was a case of hysteria, and in such instances I always like to have a strong woman around to help me. There was present a "wheel-horse" who I knew would fill the requirements, and she was pressed into service. I directed her to get the patient out of bed every night by force, put her on a commode and run hot water on her back. I instructed that this water should be as hot as she could comfortably bear her hands in. The patient stood this treatment for seven nights, and was cured of blindness, paralysis and everything else!

Case XI.— A woman fifty years of age, also a sister of charity. At the age of twenty-five she was seen by Dr. Crow, of Louisville, on account of some menstrual disorder. He put her to bed and she had been there practically ever since. During the first six years she left the room occasionally, but for nineteen consecutive years she had never been out of bed! She heard of case No. 10 and, having some of the element of faith, she was brought on a bed from her home forty miles distant to the St. Joseph Infirmary, in Louisville, and I was called to attend her.

I found the patient was quite fleshy and very flabby, with no muscular power. I asked her what was the matter with her, and she replied that every time she got up something "dropped down inside of her!" My diagnosis was chronic hysteria. I told her I would get a "contraption" that would cure her of the symptom of "something dropping down inside." This sensation was always referred to the left side at about the splenic region. I again pressed into service the "wheel-horse," telling her to take a piece of brown domestic and pin it tightly around the patient's upper abdomen and lower chest. I also gave her hypodermically one-thirtieth grain of strychnine after each meal

telling her it was a most powerful medicine and would make her strong! The nurse was directed to stand her on her feet several times every day and require her to take a few steps each time, gradually increasing the distance. At the end of three weeks she was walking around the infirmary, shortly thereafter she went out on the streets, and is now in Memphis, Tenn., on a mission trying to make up the twenty-five years she lost!

CASE XII.—A girl, twelve years of age, was brought to me by the matron of one of the charity institutions in Louisville on account of a crippled hand. Upon examination I found this child's hand in contracture, hyperextended at the wrist and flexed at the fingers, perfectly rigid. The history was that she had been peeling potatoes and got it in this way. I straightened the hand immediately by force and produced the hot iron and let her see it, then told Miss Miller who brought the child to me to bring her back again if the hand later became crooked and I would use the hot iron! I put the heated point near the child's ear that she might feel it was hot and be duly impressed. She was immediately cured and has remained well since.

This report embraces simply a few of the many cases I have seen. There is one class of these patients to which I particularly desire to refer in closing, namely, the so-called phantom tumors. We see them frequently, usually in girls about sixteen years old, and the tumors grow instantaneously; at one time the tumor will be high up in the abdomen, at another low down, simulating pregnancy. The treatment I usually administer in such cases is to slap them quickly, and the shock causes the tumor to disappear. It is often poor policy to do much in the way of examining such patients. We must cure them quickly. The more one makes over them, the greater difficulty will be experienced in getting them under your influence.

To repeat, the greatest difficulty which stands in the way of curing many of these hysterical patients is the sympathizing relatives and friends. Until they can be gotten out of the way, little good can usually be accomplished.

DISCUSSION.

DR. HERMAN E. HAYD, Buffalo.—It is very refreshing to hear a paper such as that read by Dr. Vance, coming from a practical, thoughtful student and surgeon as he is. Probably every one of us has had such experiences as he has related in his paper. However, the great difficulty in connection with the

treatment of these cases is the diagnosis. Unfortunately, the pendulum does not swing altogether in his favor. Every one of us has seen patients who have been sadly neglected, who have been treated for all kinds of so-called hysterical symptoms, when there was really a pathologic condition at the bottom of it—not merely one pathologic condition, but several pathologic conditions—making the case extremely complex, and, therefore, the reason why so many of these neurasthenics, hysterics, neurotic women are not cured is not because they have not had good surgery, but because they have not had enough good surgery.

Let us take reflex irritation of all kinds. A reflex irritation is capable of producing any of the symptoms which Dr. Vance has mentioned in his paper. For instance, eye reflexes, reflexes from the ovaries, from a retroverted uterus, from chronic appendicitis, floating kidney, and the like, and if the pathologic conditions are not removed, the patient will remain uncured. It is not fair for us to say they are simply cases of hysteria. I can understand how some of these patients could be relieved by the treatment which Dr. Vance has suggested under the influence of his strong personality. By placing these patients under vigorous and sensible hygiene, persuading them to make use of their own resources, inducing them to take advantage of these resources, their nervous systems are improved.

Early in my practice I had a case of hysterical aphonia. It was an exceedingly interesting case. I had seen this work which Dr. Vance suggested in his paper carried on very largely in the Nervous and Paralytic Hospital in London, and I was alive to the situation. The patient was a young girl who had not spoken above a whisper for many months. She was brought to me after having been under the care of one of our very best medical men in the city. I had a housekeeper who lived in the rear of my office, and I called her in and asked her to bring me a red hot poker. I stepped upon the mother's toes and said, "This young girl is going to be cured immediately; if she does not speak at once, I shall have Mrs. Fitzgerald burn the girl's throat." The mother said, "No, you are not going to burn the child's throat." I stepped on her toes again, and then she understood what I was after. The red-hot poker was brought in, and just as I approached the girl's throat she began to speak, and never had any difficulty in the way of hysterical aphonia since.

Such an experience as that is to be contrasted with one I had last year, of a woman, twenty-three years of age, of splendid German family, apparently in good physical condition, except that she was neurasthenic. She had been treated by a neurologist for six weeks in a general hospital; she was then put in Dunham's Sanitarium for another six weeks, under the care of Dr. Dunham. It was said that for thirteen months she was bed-ridden and never walked during that time. Those men never thought of instituting a careful vaginal examination. On examination I found the girl had a marked retroflexion of

the uterus. I had her taken to the German Deaconess's Hospital, operated on her, did an Alexander operation, as well as a dilatation, and she has been absolutely well since, so far as her locomotion is concerned. There is a possibility of our being enthused too strongly with the idea that these conditions are pure neuroses, pure functional conditions, when in reality there is a strong, dominant pathologic element in the case. The longer I practise medicine, the more carefully I study these cases, and the more I adopt Morris's sign of differentiating various peripheral reflexes, I find that there is not so much functional hysteria; that these cases have usually a definite pathologic basis. We operate on many of these patients. One may go to Dr. Bonifield, who finds a retroverted uterus, and he does an Alexander operation or a Gilliam. She goes to another man who finds a floating kidney, and she goes to the next fellow, who may find a chronic sclerosing appendicitis. Every one of these conditions is capable of masquerading every single symptom the essayist has mentioned, and until the organs are placed in a normal condition a cure cannot be expected. The difficulties attending the diagnosis of these cases are so great that a man has to be exceedingly careful when he says that this or that is a simple case of hysteria.

Dr. Charles Greene Cumston, Boston.—The subject discussed by Dr. Vance is very important. He has called attention to a fact with which general surgeons are familiar—namely, that the lower limbs are the part of the body which is more apt to give rise to hysterical symptoms, such as pseudotubercular lesions of joints and the like. In several patients I have found that the quickest way to make them walk, after they have become convinced they had hip-joint disease, was to mention in their presence that high amputation was the proper thing, and in the cases I recall the patients were able to walk in a short time afterward.

There is another thing mentioned in the paper of Dr. Vance which is excellent treatment, and that is flagellation, but I am afraid that if it were practised generally one would need some legal protection.

A patient I saw and operated on many years ago was interesting from the fact that the young woman's case was diagnosticated as hip-joint disease, and apparently she presented every symptom of it. She had not been able to walk except with the aid of crutches for several months. She was seen by one of our best orthopedic surgeons, who confirmed the diagnosis made by the family physician of hip-joint disease. However, the case drifted into my hands; I made a pelvic examination under ether, and found the joint was free. The orthopedic surgeon had not examined her under an anesthetic. The right hip-joint was perfectly free. By careful examination I mapped out a large hydrosalpinx, and upon the removal of it the hip symptoms disappeared.

When I was a house surgeon in Geneva I saw a great many

cases of the grand mal, such as we do not see often here. American women are not prone to give evidence of hysteria in the marked degrees we see it in Europe, but occasionally one will meet with it. Many years ago, when I first started in practice, a young woman consulted me for swelling of the elbow-joint. She came from a neurotic stock, and was more or less a neuropath herself. The elbow was slightly enlarged and puffy; she complained of excruciating pain when it was palpated. For reasons which I do not now recall, I diagnosticated her case as hysterical joint, telling her, in the form of suggestive treatment, that by putting the arm up in plaster of Paris for two weeks it would be absolutely cured when the plaster cast was taken off. I put up the elbow-joint in a plaster cast, and took it off at the end of the time decided on, and when I did so, there was a very beautiful ankylosis at right angles. The elbow-joint could not be moved. To make a long story short, we examined the vaginal discharge, found gonococci, and I had to do a resection of the joint.

Dr. John A. Lyons, Chicago.—I merely rise to take issue with Dr. Hayd and to defend the position taken by Dr. Vance. I do not think we should content ourselves with the idea that there is marked pathology in these cases of hysteria, and in treating them I think the more suggestion we use, the better. I am satisfied I have cured a good many people of their imaginary ills by suggestion.

I recall two cases which I desire to cite in connection with this subject. The first patient I will refer to was brought to me about nineteen years ago by her friend, an old patient of mine. She was thought to be pregnant and wished to engage my services in her confinement. In order to determine the condition of the pelvis and presentation of the child and thus be ready for any emergency, I examined the woman, and after doing so asked her friend to step into the other room that I might quietly let the patient know her true condition. She would not stand for that, and said, "Whatever you have got to say, say it in the presence of my friend, Mrs. Murray." After another examination I told her she was not pregnant. She said I was a fool, got up out of the chair and walked away. In less than six weeks from that time the woman returned crying pitifully, and wanted my services. She said the neighbors around the block all were helping to make clothes for her coming baby. "What am I going to do? I must have a baby." I said to her I did not know how she was going to have a baby when she was not pregnant. However, I happened to have a professional friend at the Cook County Hospital, and calling him up by phone, I said, "Doctor, I am in great difficulty; I want you to find a baby for me." After giving him the particulars about the case, he said, "Lyons, we have a boy who was born last night, and if you will come with a carriage I think I can arrange it so that you can have him. A carriage was accordingly sent to the hospi-

tal, we got the boy at two or three o'clock in the morning, then when the neighbors began to awake at about seven o'clock the woman began having severe labor pains, so severe that she could be heard yelling half a block away, at about eight o'clock the baby was supposed to be born; the neighbors as usual came in and congratulated her on the birth of her beautiful boy. That woman has been a most excellent mother to her adopted child ever since, and he has now almost reached manhood, a blessing and credit to her.

Again, I recall the case of a man who, after falling fourteen feet to the ground, thought he was killed. He was picked up by his friends, carried to the house, laid down on the kitchen floor, and I was called. When I made an effort to examine him fright was terribly apparent, he said, "Don't touch me! don't touch me!" in such a peculiar manner that I suspected there was something peculiarly wrong, and although he fell fourteen feet I decided, after careful thought, there was actually nothing the matter with him. I got the man up on his feet, pushed the hands who held h m away, and made him walk without aid; then he discovered himself. There was nothing seriously wrong, nor has there been as a result of his fall at any time since.

I believe it is a mistake to think there is marked pathology in these hysterical cases. We must practise suggestion in dealing with them, but individually I have not been able to believe there was any serious pathological conditions in many of these cases. I have, however, noticed in some a most persistent lack of will-power, appearing as though an evil spirit had surely taken possession of them, so cunning were they in their actions and determined to gain their point that nothing short of physical restraint, or a determination through instructions given in their hearing to use such restraint, was at all effective.

Dr. Roland E. Skeel, Cleveland.—I believe this paper one of the most important that will be brought before the Association at this meeting. The views expressed by Dr. Vance more nearly meet with my approval than the remarks of the first gentleman who discussed it. I think not only the welfare of the medical profession itself, but its patients, depends upon recognizing the fact that there are two factors in many of these cases; that while there may be minor pathology in a great many instances, that minor pathology is only recognized by the patient himself or herself, as the case may be, by reason of an overexcitable condition and oversensitive nerves, and that we really forget those two factors, and forget, too, that if we undertook to discover this minor pathology we would find it. Inasmuch as there is no such thing as a perfect human body, if we hunted up all the pathology and dug it out with our knives, scissors, and hemostats, our patients would not be cured except in a limited number of cases. In these cases of minor pathology I obtained undesirable local notoriety by reading before our local medical society a paper on this line. I pointed out the difficulty

of separating the cases of true hysteria from those which have a pathologic condition back of them. The hysteric patient may have a pathologic condition and a patient with a pathologic condition may have hysteria, as a chronic appendicitis, a movable kidney, or the like.

So far as reflexes are concerned, they will become simmered down in the next few years. We may have reflex trouble from a chronic appendicitis. Many cases of so-called reflex trouble of the stomach are due to a pathologic condition of the appendix. This concerns the embryologic development of that portion of the gastrointestinal canal. And so, I believe, too much discussion on purely scientific lines cannot take place in this respect, because as gynecologists a number of us deal largely with women, and so often do we forget the fact that there is much more to a woman than her genitalia, especially the modern woman under the stress of modern social life, that a tilted uterus half an inch one way or the other, or a cervix which is nicked, or a perineum which is scarred, or a uterus which has a small nodule in it, is held responsible for the bizarre symptoms from which the patient suffers, but if that woman were taken out of her home, put on a farm, and made to cut corn and hoe potatoes, the reflex troubles would fade away. It is because of this fact that so many of the modern faith-healers have taken such a strong hold, and until the medical profession recognizes this, just so long will the medical profession fail to be the power it ought to be for good among the people at the present time.

Dr. Vance (closing the discussion).—I am very much obliged to the Fellows for discussing my paper so freely and frankly. The principal thing is to make an accurate diagnosis in these cases, and after this is done, then carry out your suggestion even to the spanking.

COMPARATIVE MERITS OF ABDOMINAL CELIOTOMY AND COLPOTOMY IN THE TREATMENT OF INTRAPELVIC ABSCESS.

BY

WILLIAM S. SMITH, M.D.,

Baltimore.

THE exigencies and exactions of other lines of effort and the limitations inseparable from service in a comparatively small general hospital have prevented me from indulging an undisguised fondness for gynecologic surgery to an extent which otherwise would have been possible. With this fact uppermost in my mind, I quickly laid against myself the charge of unpardonable temerity when I first thought of presenting an address to this national association of physicians, most of whom have had far more opportunity and far more extended experience than it has been my privilege to enjoy. For about ten years, however, I have labored with such persistence and assiduity as circumstances would permit and, even in that short period of time, I should long since have become convinced of my unqualified unfitness for a self-imposed task if I had not been able to arrive at some useful and practical deductions from personal experience. Moreover, in discussing the subject about which I shall speak, I am sustained by the comforting thought that, no matter what position I may assume or which side of the argument I may espouse, I am supported by the opinions and practices of a long array of distinguished men, the preeminence of whose skill and the maturity of whose judgment cannot be questioned.

I find upon referring to my records that most of my hospital operations have been performed upon the so-called uterine appendages, with quite a respectable aggregate number of cases of pyosalpinx included in that category. The list of topics given in the transactions of this Association seems to indicate that for several years at least there has been no formal presentation of the subject indicated by the title of my paper. These considerations and a cheerfully acknowledged desire to assist, as best I can, in promoting the success of the meeting here in our city, constitute my reasons for appearing before you at this time.

I feel safe in saying that pelvic infection, in its multiform manifestations and results, of which pus production is but one, presents the most common and at the same time the most difficult problem with which gynecologists have to deal. This problem is old enough in some respects to have been coincident with the very birth of surgery, and yet is new enough to interest and inspire the most enthusiastic devotee of modern surgical art. The adjacency of the genital tract to the intestines, the physiological functions of menstruation and parturition and the enormous abuses to which the special organs of the female are subjected furnish such favorable conditions as to make these organs the most frequent site for the introduction of bacteria. Unquestionably, infectious diseases of the female pelvis and especially of the Fallopian tubes and ovaries, produce more suffering and more fatalities than all other gynecologic ailments.

I trust the word "intrapelvic" has not been inaptly chosen. Since the earlier days of Virchow and Sir James Y. Simpson the term "pelvic abscess" has held a unique and peculiar place in surgical nomenclature. Though in its literal significance it is clearly applicable to any pus formation located in the pelvis, it has by common usage and concurrent action been so long and so intimately associated with so-called parametritis and pelvic cellulitis that one hesitates even now to employ it in any other connection. In as recent a publication as the "Diseases of Women," by Sutton and Giles, we find that pelvic abscess is described as a collection of purulent fluid within the folds of the mesometrium. It is scarcely necessary to say that this reference is not made in a censorious or derogatory spirit, for our illustrious predecessors had a most rational basis for the nosology which has met with such universal acceptance. The scanty resources of diagnosis, the absence of opportunities for direct macroscopic and microscopic examination of diseased structures, the prevailing methods of obstetric management and the technic of local medication and instrumentation amply explain, if they do not justify, the opinions held and the doctrines promulgated a few decades ago. Regarding the old-time frequency and causation of parametritis and perimetritis a few quotations should be of interest.

In Hart and Barbour's "Manual of Gynecology," published in 1883, we find the following language: "It is the rare exception to examine a female pelvis without finding some traces of a previous cellulitis or peritonitis. The split cervix, so common

in women who have born children, is almost always associated with some cellulitis at the base of the broad ligaments." Heinrich Fritsch, in his "Diseases of Women," published about the same time, after referring to the puerperal cases, has this to say: "Similar to lesions during labor is the effect of injuries during minor operations on the cervix, preeminently plastic operations, or the treatment with laminaria or sponge tents. Severe parametritis is repeatedly observed as the sequel of the above-named manipulations. There is hardly any gynecologist who has not experienced accidents of this nature. Especially the treatment with stem pessaries is often followed by disease of the pelvic connective tissue. I have seen several cases of universal peritonitis due to the employment of sponge tents, which ended fatally in five or six days. Such cases have occurred now and then during nearly all gynecological operations previous to the use of antisepsis." The last word in this quotation tells the story, for in recent years the advent of asepsis into surgical and obstetrical practice has brought about a readjustment and realignment of the causal factors of pelvic disease, revolutionized the methods of its treatment and made the older text-books on the subject of little more than historic interest.

The tremendous impetus which has thus been given to operative work of all kinds has furnished the richest opportunities for the study of these diseases, both from a pathologic and a bacteriologic viewpoint. By the utilization of these opportunities we are now able to describe with an approach to accuracy not alone the various forms and positions assumed by intrapelvic abscess formations, but also the indirect and exciting agencies which lead to their production. The recognition, isolation and study of the tubercle bacillus, the gonococcus, the streptococcus, the staphylococcus, the colon bacillus and others of less importance have definitely fixed the responsibility for most of the pathologic conditions in the female pelvis, while the examination of encapsulated pus *in situ* has enabled us to say that in the vast majority of instances it means pyosalpinx, ovarian abscess or tubo-ovarian abscess, and that in hospital practice at least it is found with comparative infrequency in the cellular tissue or parametrium. I say in hospital practice deliberately, for notwithstanding the incalculable good which has been done in the prevention of puerperal infection and the infrequency with which its evidences are seen in the surgical and gynecologic clinics, it still follows with deplorable regularity in the pathway

of ignorant and uncleanly midwives, quasi obstetricians and professional abortionists. And even those who are most keenly alive to the importance of clean methods and who consistently observe an aseptic obstetrical technic are now and then surprised by its occurrence.

In the earlier years of my practice I have frequently been called upon to treat abscess formations arising under such circumstances and I have done so successfully by simple vaginal incision. Other cases are allowed to go untreated until spontaneous rupture occurs in the direction of least resistance and pregnancy follows upon what seems to have been an absolute cure, thus affording a practical demonstration that true primary parametric abscess does occur without involvement of the uterine tubes. Leaving out of consideration numerous instances of this character in which there is usually a direct invasion of the cellular tissue, the hospital surgeon is likely to become biased by his own observations and to place an exaggerated estimate upon the relative frequency of cases arising by invasion of the Fallopian tubes. For the same reason, I am inclined to think, the influence of the familiar gonococcus in its relation to suppurative changes in the pelvis has been somewhat overstated. For instance, Dr. Prince A. Morrow, of New York, who has shown great interest in this subject, both in its scientific and sociologic aspects, asserts that the gonococcal form of infection is responsible for 80 per cent. of all deaths from the inflammatory diseases peculiar to women, practically all the pus tubes, more than 75 per cent. of the suppurative pelvic inflammations and 50 per cent. of all gynecological operations.

Other conditions in connection with which intrapelvic abscesses are sometimes found are necrotic or suppurating uterine fibroids, infected ovarian dermoid cysts, broad ligament hematomata and appendicitis, where the appendix has been downwardly displaced and occupies a position in the pelvic cavity. Such cases are comparatively rare and represent complications of the main disease with which the operator is chiefly concerned. They cannot for this reason be looked upon as coming within the proper scope of this address.

The treatment of pelvic suppuration during the last quarter of a century has undergone striking and almost kaleidoscopic changes. Beginning with an ultraconservatism which we of the present day find it difficult to condone and which could be appropriately described by the injunction, "Remove nothing,

let Nature do it all," we are to-day confronted with an extreme radicalism which can with equal propriety be expressed by the opposing maxim: "Remove everything, for Nature can do nothing." Curiously enough, this radicalism may under certain conditions be extended to the opposite sex, for Veit, in Germany, has suggested, as a preventive of recurrence in the gonorrheal cases, the castration of the offending husband.

Three decades ago we were told, to quote a text-book on the subject, that "the occurrence of suppuration is indicated by rigors and should be hastened by hot douches and poultices. Opening a diagnosticated abscess is to be advised only when the natural process is hastened thereby or a vital indication is furnished by sloughing," A little later it was timidly suggested that "tapping with Matthieu's aspirator is very good and may be often repeated" and that "when pus is present in large quantity, the treatment varies according to the part at which it points." Then came the practice of unhesitatingly incising and evacuating pelvic abscesses through the vagina, sometimes with prompt and permanent relief of suffering. This was followed by the removal of suppurating appendages through Douglas's culdesac as well as by the abdominal method, the efficacy and propriety of which were boldly challenged by Jacobs, Pean, Segond and others who almost startled the profession by declaring that the uterus was the underlying enemy, that it should be removed by vaginal hysterectomy and that the tubal or ovarian pus sacs need not be disturbed.

Hence, at the present day there is nothing like unanimity of opinion or uniformity of practice in dealing with this important problem. Indeed, it is so many-sided and so complex that it would be preposterous to attempt to establish rigid rules designed to apply to any special method of surgical attack. In this as in every other pelvic abnormality requiring operative intervention, each case has features peculiar to itself, all of which are intelligently weighed in outlining and conducting the proper surgical procedure. Nevertheless, there are certain general principles and well-recognized facts which, if consistently and thoughtfully borne in mind, will assist materially in solving the vexed question.

Among the numerous operations, vaginal and abdominal, which are now practised for the relief of the condition under discussion, abdominal celiotomy and colpotomy are, I think, most easily accomplished by the average surgeon. In selecting

one or the other of these methods, any rational and logical conclusion must have for its foundation the clinical features and physical findings, the peculiarities of the infecting organism, the structural changes produced by it and by the reactionary inflammation to which it gives rise, as well as the various important complications which are constantly encountered. The history of a given case will frequently enable one to select the proper operation.

Reference has already been made to some of the offending bacteria. As a matter of fact, in so far as the ascending infections are concerned, I think we need consider only the gonococcus and the streptococcus. The former, as is well known, almost always travels by direct continuity of mucosal tissue and finds its way into the tubes by extension from the endometrium. Streptococcic infection, on the other hand, generally occurs in consequence of an ill-managed labor or puerperium in connection with an abortion or after unclean instrumentation of the interior of the uterus. Having gained access to that organ, the streptococci invade the pelvis through the medium of the veins and lymphatics and thus reach the parametrium.

The clinical features are also distinctive in most instances. In gonorrheal cases, the symptoms referrible to the pelvis are frequently preceded by a urethritis, the very existence of which is strongly indicative of that disease. The invasion is masked and insidious and several weeks may elapse before attention is directed to the pelvis, and even then there is seldom any evidence of active inflammation. An extremely valuable and characteristic feature of tubal gonorrhea is the occurrence of repeated attacks of localized peritonitis, supposably due to the leakage of purulent material from the abdominal ostium or to the passage of the infection directly through the tubal walls. When the streptococcus is at fault, the attack is traceable, as has been said, to a labor, an abortion or to the local use of instruments. The progress of the infection is rapid, marked by severe rigors, elevated temperature and markedly accelerated pulse. Abdominal pain, distention and tenderness are great. These are the cases also in which the tendency to general peritonitis or septicemia is observed.

The physical findings in the streptococcic cases are not always definite or satisfactory, so that the diagnosis of pus formation may of necessity be inferential. If there be an extraperitoneal abscess, it may be detected by bimanual examination and usually

bulges into the vagina at the lateral fornices or before or behind the cervix. It is often unilateral and is in intimate relationship with the uterus, differing in this respect from the tubal and ovarian masses. It is often impossible to elicit fluctuation. The infiltration of the surrounding structures, however, gives rise to an almost characteristic dense induration by which the presence of pus can with an approach to certainty be determined. Primary parametric pus collections are in the vast majority of instances comparatively short-lived and, as has been said, either empty spontaneously or are evacuated by vaginal section and disappear. They therefore play an unimportant rôle in the familiar chronic intrapelvic suppurations for which the adnexa are so frequently removed.

In the gonococcic cases the physical examination is of great interest and value in determining the choice of a method of operative attack not alone from what it reveals, but also from what it so often fails to show. It must be said that the gross lesions in chronic salpingitis are, in a general way, easily determined by the ordinary palpatory signs. It is equally true that it is often if not usually impossible to determine with exactness the precise nature of these lesions or to differentiate among them. A slight or moderate enlargement of the tube may be a pyosalpinx, a hydrosalpinx, a hematosalpinx or an interstitial salpingitis, and no matter how highly developed the tactile sense or how refined the diagnostic skill, conclusions in such cases must be largely supposititious or inferential. The diseased oviduct is commonly displaced and adherent in the culdesac of Douglas; it may also be found beside the uterus or fixed to the posterior aspect of the broad ligament. Only rarely does it lie in front. The tubal masses are identified by the classical sausage-shaped, pear-shaped and retort-shaped swellings. When oviduct and ovary are bound together by adhesions, as they so often are, they form a tumor irregularly spherical in shape and firm in consistence. The pre-operative findings in many instances are remarkably deceptive. I am sure it is a common experience with us all to observe that a tubal or tubo-ovarian mass, which appears by palpation to be of considerable size, is found upon enucleation to be surprisingly small. Even in the comparatively rare cases in which the tube can be isolated and outlined, it is frequently impossible to elicit fluctuation on account of the small amount of fluid it contains or the thickness of its walls.

The great frequency of tubal tuberculosis and the tendency

of that disease toward the formation of pyosalpinx are among the interesting and important disclosures of recent years. Published reports of pathologic and bacteriologic studies of tubal abscess present widely different results, so that even an approximate estimate of the relative frequency of the tubercular form cannot be given. It is probably true that next to the gonococcus and the streptococcus, the tubercle bacillus plays the most important direct rôle in the etiology of that condition. According to Penrose, it is the infecting organism in 18 per cent. of all cases of inflammatory disease of the adnexa. Barton Cooke Hirst found it responsible for 20 per cent. of a series of similar cases, while Whitridge Williams's estimate was 8 per cent. Unfortunately, the differentiation of tubercular from other forms of tubal disease is usually impossible by any method other than the removal and examination of the affected tissues. Its existence may be assumed in salpingitis occurring in virgins and when tubercle bacilli can be demonstrated in the leucorrheal discharges. The frequent and unsuccessful efforts at cure by incision and drainage of pus tubes later found to be tubercular in nature would seem sufficient to invest this aspect of the subject with great practical importance, and a great advance will have been made when by some diagnostic refinement the presence of tubercular salpingitis can be foretold and excision rather than incision methods practised for its cure.

I shall content myself with the mere mention of the familiar complications which are directly attributable to nature's reaction against the invading organism; namely, the uterine and ovarian displacements and the adhesions to adjacent structures. Those, however, which are referrible to the appendix cannot be thus dismissed. Within recent years the frequent association of pelvic and appendicial disease has attracted great attention from gynecologists, many of whom make a routine examination of the appendix in the course of abdominal operations and remove that organ when such a procedure seems indicated. Some go even further and do an appendectomy in every case not merely for purely prophylactic reasons, but because it is not always possible to determine by naked-eye appearances whether the structure is healthy or diseased. The relationship and pathologic interdependence of appendicitis and adnexal inflammation have not been definitely determined, but the coexistence of these conditions is so common as to be of great practical moment. Fowler tells us that Clado's appendiculo-ovarian ligament

furnishes a pathway along which bacteria may migrate from the intestine to the right ovary.

Certain it is that the colon bacillus has been repeatedly demonstrated in ovarian as well as tubal abscesses. In the AMERICAN JOURNAL OF OBSTETRICS for July, 1904, Reuben Peterson published an article giving the results of careful clinical and microscopic study of 200 cases of pelvic disease with reference to the condition of the appendix, and announced in his conclusions that nearly 50 per cent. of patients with chronic disease of the tubes and ovaries show accompanying disease of the appendix. He says it is the surgeon's duty in the absence of special contraindications to remove that organ in the course of every gynecologic abdominal operation. In a histologic examination of 120 appendices removed as a coincident part of some other abdominal procedure a normal condition was found by John G. Clark in only twenty-five. J. Clarence Webster has found it advisable to do an appendectomy in about 50 per cent. of the cases in which he has opened the abdomen. During the last two years it has been my habit to examine the appendix at every opportunity and to remove it when visibly and palpably diseased. and I have found this to be the case in about one-third of my cases.

With these affirmative observations, bearing in a general way upon the desirability of abdominal section in intrapelvic pus collections on account of rather common and often unsuspected complications, I am prepared to state more definitely and specifically the reasons for the conclusions to which I have been led and the practices which I have followed. In acute primary parametric abscess the indications are clear and strong for vaginal incision, and the results are usually prompt and permanent, as are the results elsewhere in the body when pus has arisen and is located in connective tissue. In cases of large tubal or ovarian abscess of recent origin and within easy reach of the vaginal finger, colpotomy, as a palliative and temporizing measure, finds a useful application. In those rare instances where the general condition of the patient will not permit prolonged surgical manipulation, there can, of course, be no question as to the propriety of at least a preliminary and preparatory vaginal section. In all the chronic cases, and especially in the tubal and ovarian pus sacs, I am thoroughly convinced of the ineffectiveness of colpotomy and almost invariably practise the more precise, rational and satisfactory method of abdominal celiotomy, unless there is some special contraindication.

This method of approach is, in my opinion, distinctly indicated when the conditions present point to the propriety and practicability of conservative surgery, and when the existence of bilateral pyosalpinx can fairly be assumed and complete exsection of the tubes stands as the only hope of absolute and permanent relief. Conservatism has in recent years been a great surgical watchword and inestimable advantage has followed its recognition and adoption as a basic principle. The vaginal celiotomists have by great patience and perseverance in developing an awkward and difficult technic accomplished wonderful results in that direction. The burden of my remarks, however, does not contemplate a comparison of the facility and effectiveness of reparative surgery by the suprapubic and subpubic methods, great as are the advantages of the former. The colpotomists—the vaginal sectionists have not been slow in their appropriation and adaptation of this great argument—they are doing "conservative" work, they are "preserving" the pelvic organs and leaving them *in situ*.

I submit that such work does not deserve to be called "conservatism" in its best and highest sense, and that the leaving of hopelessly crippled and functionally useless organs cannot be justified by that contention. Women with double pyosalpinx do not and cannot become pregnant as a result of any incision and drainage operation and the diseased oviducts cannot be restored to physiological usefulness. If the pyosalpinx be unilateral, as it so often is, how many opportunities are missed for real constructive surgery upon the less affected side? Herein, in my humble judgment, lies the great advantage of abdominal section, affording as it does opportunities for careful examination not alone of the numerous complicating conditions to which reference has been made, but of the less seriously affected side of the pelvic basin, and offering to the touch, to the eye and to the surgical skill and judgment unlimited chances for repair, readjustment and readaptation of displaced and diseased structures and for the exhibition of sound and real conservatism as opposed to that which only bears the name. Numerous cases from my service might be cited in illustration of this proposition and I should like to refer briefly to a few of them.

Case I.—Mrs. A. was operated upon February 21, 1908, for pyosalpinx. Right tube and ovary were large and adherent to rectum and to the side of the uterus and lying in Douglas's pouch. Left tube and ovary also adherent, but lying more to

the side of the uterus. Mass on the right side had been treated on January 20 by vaginal incision and a small amount of pus escaped. The appendix was found firmly adherent to posterior layer of broad ligament—much elongated, thickened and intensely congested. Uterus retroverted and only slightly movable. Right tube and ovary were entirely removed. Left tube amputated about one inch from the uterine cornu and ovary stitched to the remaining stump with the hope that pregnancy might still occur, patient being but twenty-three years old and without children. Tube was shown to be permeable by a small wire passed into the cavity of the uterus which had of course been curetted. Appendix was removed. This case is interesting as an example of the incompleteness and inefficacy of vaginal incision in cases of tubal abscess. Relief had not been obtained, but how much suffering was due to the persistence of pus in the tube and how much to the position and condition of the appendix could not of course be estimated.

Case II.—Mrs. M. Operation, March 27, 1908, for pyosalpinx and tubo-ovarian abscess. History pointed to gonorrheal infection, pain and invalidism for about three months, beginning with urethritis and leucorrheal discharge. Pain on both sides, but chiefly on left side, with menorrhagia, painful defecation and reflex symptoms. Physical examination showed an elastic mass about as large as the average orange behind and to the left of the uterus, easily palpable and with thin walls. On the right was a hard, irregular, nodular mass close up to the side of uterus, but no fluctuation could be elicited. Here was a strong temptation to do a posterior vaginal section, but in the hope that some conservative work could be done on the less seriously affected side, I decided to do a celiotomy. The mass on the left proved to be a tubo-ovarian abscess, which, after separating a few adhesions, was delivered through the incision as easily as if it had been a simple demoid cyst. Right oviduct and ovary were firmly adherent to the side of the uterus and to the rectum. Tube thickened to the size of my forefinger and contained a small amount of cohesive, tough and cheesy material. Double salpingo-oophorectomy was done. The findings in this instance showed the wisdom of the course pursued. The mass on the left was of course intraperitoneal, and both tube and ovary were hopelessly diseased. Their removal was easily accomplished through the abdomen. The right abscess could not be accurately outlined, no fluctuation was perceptible, and satisfactory vaginal

incision would have been extremely difficult and effective drainage impossible.

Case III.—Miss H. Operation, April 3, 1908. I had operated on this patient in July, 1907, for right pyosalpinx. Pain did not entirely disappear and suffering has recently been great. Operation to-day showed a surprisingly good condition of the uterus and the remaining tube and ovary. Uterus was small, freely movable, and the adnexum apparently healthy, the tube being small, soft and patulous and the ovary smooth, firm and free of any evidence of inflammation and easily movable in all directions. Cecum was brought into incision and a congested and adherent appendix was removed. This should have been done at the former operation.

Case IV.—Mrs. W. Operation, May 28, 1908. This case presents a number of interesting features. Patient had lately been running a temperature of 102 and 103, with great tenderness and pain, denoting active inflammation. Vaginal examination disclosed a tubo-ovarian mass within easy reach of the finger. This was presumably a pus sac and seemed to present favorable conditions for colpotomy. It was, however, a movable mass and lay some distance from the uterus, so I decided upon an abdominal section. On opening the abdomen, I found that a suspension had already been performed and that there was a round cord at least three inches in length extending from the fundus to the lower angle of the old incision. It had become useless, as the uterus was lying in a retroverted position. Right tube and ovary were adherent, but the adhesions were frail and easily broken and the mass lifted without trouble toward the incision. Tubal walls very thick and contained a few drops of pus, ovary cystic. Left ovary and tube slightly adherent, but otherwise healthy and were left. Appendix large, club-shaped and congested and was also removed. Old suspension ligament cut off and new suspension done. This case was clearly not amenable to cure by colpotomy, although the clinical features and physical signs suggested that procedure.

Case V.—Mrs. J. Operation, August 3, 1908. Patient had suffered for several months from pelvic pain and had recently run a temperature of 102 with great tenderness upon bimanual examination. She was urged to wait for the subsidence of acute symptoms, but insisted upon being operated on at once. An elastic, fluctuant mass could easily be felt through the posterior fornix in close relation with the uterus. No other masses were

palpable. This was presumably pus and offered a strong temptation for posterior colpotomy. Abdominal celiotomy was done, however, and the conditions found amply justified that procedure. Adhesions were general throughout the pelvis, and an ovarian cyst was jammed down behind the uterus and projected through Douglas's pouch. This cyst was adherent to the rectum, to the uterus and to a pyosalpinx on the opposite side. The right tube also contained pus which was above and beyond the cystic growth, far out of reach of the vaginal finger. The diseased organs were removed without special difficulty, the adhesions breaking easily. A vaginal puncture would have emptied the cyst and left the far more serious tubal pus sacs untouched.

As to the desirability of complete exsection of the tubes for pyosalpinx but little argument should be necessary in the light of the clinical and microscopic study of this condition. There can be but one reason for the retention of the diseased oviduct—the possibility of its being restored to functional activity. That there is no such possibility has been sufficiently shown by many observations incident and subsequent to abdominal operations in cases where spontaneous rupture had taken place or incision and drainage had been practised, supplemented by careful pathologic work. The organs are found in such instances to be represented by a firm, impervious cord or a shriveled, strictured sac, clearly incapable of affording lodgment to an ovum or of permitting its transmission to the uterus. But, aside from these considerations, abundant experience has shown that tubal abscess is not, in fact, amenable to even practical cure by drainage methods, and that, to quote a recent authoritative utterance, "Unlike the ordinary abscess, a pyosalpinx is commonly made up of several loculi and its lining consists of the inflamed and distorted mucous membrane. If in some way the pus is discharged or evacuated, in a short time there is a reaccumulation from the diseased and discharging mucosa which lines the abscess sac or from a loculus which has not been reached."

The numerous so-called reasons given by the advocates of vaginal section are for the most part the adaptation of arguments to an assumption already taken. There are but two of them which I have been able to take seriously—one based upon the unquestioned propriety of permitting in young women the function of menstruation to continue and the other having for its foundation the slightly increased immediate danger of radical abdominal surgery. If it were true that the abdominal celioto-

mist is in the habit of removing both ovaries and both tubes as a routine practice, the former contention would be a good one. But it is not true. On the contrary, there are comparatively few cases of intrapelvic suppuration in which an ovary or at least sufficient ovarian tissue to assure the continuance of menstruation cannot be saved. As to the mortality, I am willing to concede that in any long series of cases the immediate mortality of abdominal section will exceed that of colpotomy, but the latter operation is not without its own inherent dangers. Our colpotomy friends are accustomed to growing voluble and enthusiastic when they descant upon the "harmlessness" of their favorite method. Some of them, however, are ingenuous enough to say, although in implied parenthesis, that "now and then" a knuckle of intestine may be punctured, a dermoid cyst incised or a pregnant tube laid bare. These "accidents," it seems, occur even at the hands of experts and should not militate against an operation upon which above all things the stamp of "ease and safety" has been placed.

If we consider the improvements which have been made in surgical technic, together with the striking results obtained in pus cases by the Fowler postural treatment and the Murphy irrigation, the mortality plea loses much of its significance and force. Recent experience of my own in this connection has been peculiarly instructive and satisfactory. In the last one hundred and ten laparotomies which I have done there has been no mortality. Of this number, fifty-three were performed for intrapelvic pus. Drainage was indicated and used in ten instances and the Fowler-Murphy treatment was twice resorted to. During the same period of time there have been but ten colpotomies, and two of these were followed up by the abdominal operation.

In concluding my remarks, I am pleased to quote from the statements of a few of the Fellows of this Association, whose excellent judgment and large experience make their opinions particularly valuable. J. J. Gurney Williams.—"What ultimately becomes of many cases upon whom vaginal incision has been practised? Twenty-five per cent. is about the correct number who return for a subsequent abdominal section and many others go elsewhere to be relieved of their suffering." Joseph Price.—"I have never known a patient to be cured by vaginal puncture or incision." Herman E. Hayd.—"The advocates of the vaginal method presuppose a diagnostic ability which

we all know they do not possess. In every case on which I have operated through the vagina and drained an appreciable amount of pus a later abdominal section was necessary for the relief of suffering and chronic invalidism."

There is another statement on this subject which I am particularly glad to call to my support. Indeed, a paper such as this, would, for a Baltimorean, be almost inexcusably incomplete if it did not take cognizance of the opinions and utterances of one who has done so much for the advancement of gynecology, both in its artistic and scientific aspects, and whose personality and work have made so marked an impress upon the profession of this State and city. I shall therefore close by quoting from "Medical Gynecology," by Howard A. Kelly. In considering the surgical treatment of pelvic inflammatory disease, he has this to say: "It is useless to run risks of a continuance of the trouble from which the patient is suffering for the sake of preserving the menstrual function, if she is forty years old or more. If the patient is single and middle-aged, without any expectation of marriage, the exercise of conservatism is less important. If the patient has to labor for her own living, it is best not to take too many chances of a return of the disease by leaving any crippled structures. It is dangerous to save tubes containing purulent or milky fluid. If the patient wants above all things to be well, then the physician will be less inclined to take chances with conservatism. As a rule, the results of conservatism are disappointing, and the patient ought always to be forewarned that it may be necessary to repeat the operation or to make it more radical if the first conservative effort proves a failure."

DISCUSSION.

Dr. Charles L. Bonifield, Cincinnati.—I think this is an exceedingly safe and sane paper. It is a subject that deserves discussion at least once in six years. For the most part, I agree with what the essayist has said. Vaginal incision is very important in a selected number of cases. The earlier we can get at pus behind the uterus and drain it, the less severe will be the damage to the uterine appendages, and the more hope there is of curing these patients without a radical operation. Unfortunately, even under the most favorable circumstances, it is the exception rather than the rule that these cases are cured by this simple procedure. On the other hand, to attempt to deal with these cases by the vaginal route, if the temperature has become normal, if the patient is in a condition to stand a radical

operation, is going at the disease in a very awkward and inefficient way. The mortality from operations for pus in the pelvis depends very greatly on when the operation is done. We are greatly indebted to Dr. Werder and Dr. Simpson for having called the attention of the profession to this point. Although many of us recognized the principle before they brought it out so clearly, yet they emphasized and brought to the attention of the occasional operator that it is not safe, if it can be avoided, to do abdominal section for the removal of suppurating appendages while the patient is having an elevation of temperature.

The question of conservative surgery of the appendages is one that always elicits a good deal of discussion. Some years ago Dr. Frederick took part in a discussion before this Association in Chicago, and I at that time said that conservatism in my practice depended a good deal on the pocketbook of the patient, whereupon Dr. Frederick immediately took issue with me, and said that his poorest patient should have the best skill as well as the rich ones. But a rich patient can afford to go to the hospital frequently, if necessary. It is worth her while to be laid up for the purpose of having two or three operations, if necessary, in order that her menstrual function may continue and she may be given a chance to become a mother, while, on the other hand, the woman who has a large family to care for, who cannot employ a servant, or who has to make her own living cannot afford to go to a hospital every year or two for operation, and in this class of patients I have almost completely abandoned conservative surgery in inflammatory disease of the appendages. Conservative surgery, in my experience, has been a success in but a limited number of cases. Conservative surgery as regards the tubes is more frequently a success than when applied to the ovaries. In years gone by I have removed part of an ovary. I have evacuated cysts and left the ovary, and in a large proportion of these cases that have returned subsequently I have reopened the abdomen and found that the remainder of the ovary was only a cyst. Dr. Miller will testify to the truth of that statement. I have occasionally left a part of an ovary and the patient became pregnant afterward, and I regard this procedure as justifiable in women who have no children and are anxious to become mothers, for even if the abdomen has to be reopened for the removal of the remnant of the ovary after the woman has given birth to a child, it was worth while to leave it, but as a matter of self-protection, when only a part of an ovary is left, I think some member of the family should be told that at some future time its removal may become necessary. One matter of great importance the essayist spoke of was as to whether the other tube should be removed when one is diseased. I should certainly say that I would not remove any organ when it gave no evidence of disease. The question as to whether the other tube will or will not have to be removed later, depends as much on the condition of the endometrium as on the condition of the

tube itself. If the other tube becomes diseased from gonorrheal inflammation, we have not cured the gonorrheal endometritis or the patient has become reinfected. A matter I consider of extreme importance in removing a diseased tube is that it should be cut out of the horn of the uterus, because that part of the tube running through the uterine wall is of sufficient length to contain innumerable gonococci that cannot be reached by medicine or by the curet, and unless this part is removed there will be reinfection of the uterine cavity and sooner or later involvement of the opposite tube.

Dr. Albert Goldspohn, Chicago.—I can also remark that this is a very safe and sane paper, showing in the main what I consider good judgment, and the best I can do is to enlarge a little on some of the features brought out in the paper.

In regard to the whole subject of surgery of inflamed or infectious conditions in the pelvis, one first law should be that we have no reason to operate, aside from a drainage operation by the vagina, in acute conditions without giving Nature a chance first. If treated medically in the same manner, very much of what is inflamed will become less inflamed or become well, and after several weeks or a month of that kind of medical treatment, the operator who would remove practically everything at the time when they are acutely inflamed, will find he is safe in saving at least one-half, and do very much better service for his patients.

In line with this first premise, the fundamental teaching is that vaginal drainage is a good procedure only as drainage, and it is permissible in the acute condition. When there is elevation of temperature and the like, what conditions are most benefited by such vaginal drainage? There comes a classification in the history of the patient that gives us a guide—namely, is the pus located in the pelvic cellular tissue, is it located inside of a tube or ovary, is it intraperitoneal? The foci of pus that are amenable to vaginal drainage are those in the pelvic cellular tissue—parametritis, that originates in conditions of parturition some infection during labor or during an abortion, or some violent instrumental interference.

Occasionally women have attempted to bring abortion on themselves, and in so doing have forced an instrument through the cervix into the broad ligament. Here, as in puerperal infection, the primary focus of inflammation is not intraperitoneal or intratubal, but is in the pelvic cellular tissue. But pelvic peritonitis—that is, intraperitoneal infections, as the gonorrheal for instance—are usually not much benefited by vaginal drainage, exceptionally only. In these pelvic infections in conjunction with labors or miscarriages, and once in a while in opening up a large pyosalpinx or an ovarian abscess situated low down, we can get at the pus and explore the interior of the pus cavity by a finger introduced through the posterior culdesac. Drainage in such cases will accomplish much. But one great trouble about vaginal drainage has been the technic has not been right.

Some operators have punctured the culdesac with scissors and introduced there gauze. What kind of drainage can you get from such a punctured wound? Incision is absolutely necessary, and the instrument I make it with is the Paquelin cautery, which stops the hemorrhage from the small vessels. A Paquelin cautery incision of two inches made in a transverse direction will give us access so as to be able to introduce one or two fingers and puncture the abscesses with the finger, empty the pus, and then pack the cavity solidly with a long-curved forceps guided by the finger. The gauze, with me, is allowed to remain a week to constitute not simply a drain, but, this packing being in there as a solid cast, is walled off by Nature's efforts to make a safe wall against the peritoneal cavity. When that packing is removed, we have a cavern remaining which does not collapse at once. We can wash it out and repack, not so solidly as we did before. In that manner we can thoroughly obliterate eventually these pelvic abscesses, and once in a while a pyosalpinx or ovarian abscess, when the mucous lining can be displaced by granulation tissue as the result of solid gauze packing. With me very few of these cases have required abdominal section later when so treated. I have been careful not to do this in cases that did not have such abscesses.

As to abdominal section, it is the thing we should resort to for the purpose of extirpation or reconstruction by all odds, and abdominal section is the route with me, in view of our duties with reference to the appendix vermiformis. Much as I have regretted to go back on my own child, bi-inguinal laparotomy for retroversion, yet I have been compelled to do it, in view of my conviction as to our duty to the appendix. I believe that it is our business to remove the appendix in practically every case, if the patient can stand it, if there is no particular contraindication, even if we do not see it is distinctly macroscopically diseased. It has been my experience in the last year to have to open the abdomen in two nurses in my employ twice within nine months, because I did not do this. I operated on them for a simple retroversion of the uterus; in one I did an Alexander operation, and in the other I operated by median section, and had the appendix in my hand. Apparently there was nothing pathologic about it; yet that girl, in eight months, had to have an operation for appendicitis in a hurry at night. In the other case I could as well have done a median section also, with transplantation of the round ligaments into the abdominal wall, instead of the bi-inguinal operation, and could have removed the appendix, as I now generally do, at a sacrifice of the bi-inguinal route. I am satisfied that this talk about not removing the appendix because it is not macroscopically diseased is without merit.

As to conservatism on the appendages, I must differ from the last speaker, Dr. Bonifield, in regard to what is permissible and what is judicious with reference to the tubes or ovaries.

The resection of tubes, making new openings, has very little promise of serving for future pregnancy. If a tube is at all diseased, I would not hesitate to remove it, and a tube is many times more the beginning of a hidden focus for trouble than is the ovary. If we will thoroughly excise the tube from the cornu of the uterus, as the last speaker has said, and stitch up the wound, leaving the ovary, the connection between the usual source of infection and the ovary is gone. As to resection of the ovary, it is a matter which calls for the exercise of the greatest judgment on part of the gynecologist, particularly as to what part of the ovary we dare save and what part should be removed. But by correct judgment as to this, by a good aseptic technic, and by introducing the least amount of fine catgut in the ovarian tissue, in resection work, I can speak of fine results in an experience of hundreds of cases. I will admit that in one case in twenty-five I may have to open the abdomen again; but I am quite willing to do it if I can save remnants of ovary and retain menstruation in all the others, which I otherwise would have to sacrifice. A woman who menstruates will pass more nearly as a complete woman, even if she be sterile. Matrimony is not beyond her reach, as it usually is with those who do not even menstruate. Menstruation is something that is needed in order to constitute a perfect balance in the woman's good feeling, and the saving of ovaries, no matter if it is only one-quarter of one ovary, is a prominent indication with me.

As to the cases that are not infected, the abdominal route is selected by me because I can get at most of the foci in the abdomen from which disorders arise, at least for palpation, which we could not do by the vaginal route or through the inguinal canal.

Dr. C. C. Frederick, Buffalo.—With reference to the relative merits of the abdominal and vaginal route, I want to lay stress on one or two points concerning the vaginal method. They are these: The vaginal route of attack is the one for drainage until the patient has gotten into a condition where we can do abdominal section, clean out the pelvis, and put the patient on the road to recovery. The vaginal route, therefore, is simply a makeshift to tide the patient over until a more radical operation can be done. I wish to illustrate what I have said by citing a case that came under my observation some time ago. This woman had a temperature ranging from 101° to 102°; she was septic, and I believe she would have died if I had opened her abdomen and attempted to do a radical operation. She had been opened through the pelvis six or seven months before, and culdesac drainage established. She did not improve, and then the same physician opened up the incision, put in a drainage tube, and packed with gauze. Still she was very little better. I slit the incision wide open so as to be able to introduce two or three fingers, and finally I went into an ovarian abscess on the left side, out of which one or two coffee-cupfuls of fetid pus

escaped. I made a free opening, so as to establish good drainage, and ran into another abscess which was evidently between some peritoneal adhesions. After evacuating the contents of the abscess I stuffed it full of gauze, and in a short time, say within seventy-two hours, the temperature dropped to normal, and the woman began to convalesce. She is getting rosy in appearance, and in about a month or two I expect she will be well enough for a radical operation.

I believe the vaginal route is indicated in just that kind of cases, but for conservative surgery I think the abdominal route is the only one to adopt to do the work right.

Dr. Blume.—Who did the previous operation?

Dr. Frederick.—A general surgeon.

Dr. Blume.—It is the fault of the surgeon, then, and not the physician.

Dr. Frederick Blume, Pittsburg.—This subject is so important and interesting that it has been brought before this Association almost yearly during the past ten or twelve years. About ten years ago I had the honor to present before the Association a paper on this subject, in which I reported some forty cases upon which I had performed vaginal hysterectomy with very good results. For conclusion I said that with the introduction of vaginal hysterectomy and the revival of vaginal incision and drainage our views regarding the treatment of suppurative pelvic diseases have undergone remarkable modifications. We have learned to appreciate the value of the differential diagnosis between the various forms and stages of the disease and realize that there is no longer but one method of surgical treatment, and that we must select that method best adapted to the case.

Prior to the introduction of vaginal hysterectomy cases of pelvic suppuration were usually treated by abdominal section with a mortality of from 10 to 25 per cent. About eight years ago, at the International Congress of Gynecologists held in Europe, one of the operators recommended to delay the abdominal operation in cases of pelvic peritonitis at least a few months after the acute stage has passed. This is done at the present time by the majority of operators with good results. Acute cases of pelvic peritonitis in which accumulations of pus can be reached through the vagina are relieved by vaginal incision and drainage. If this is not curative, the abdominal section can be done later. My results with these methods of treatment have been very satisfactory, so that years ago I have abandoned vaginal hysterectomy for suppurative pelvic diseases or restricted it to exceptional cases.

Dr. Francis Reder, St. Louis.—I appreciate very much the value of this paper and the remarks of those who have discussed it. I expected, however, to have heard a little more about the sequelæ, such as sinus formation following the vaginal operation. In this connection I wish to cite a case in which there was a

mistake in diagnosis. The patient's physicians informed me that during eight weeks prior to the time I saw her, a tumor, plainly palpable and reaching up to the umbilicus, had been forming. Although a diagnosis of pregnancy had been made, I had difficulty in convincing them of my diagnosis of a cyst. I opened the abdomen to remove the cyst, which I had diagnosticated, and found an enormous abscess of the right tube. I endeavored to enucleate the tube, but found it impossible on account of the serious condition of the patient. I had to resort to morsupialization and vaginal drainage. The patient's progress was satisfactory, with the exception that at the present time she has an ugly sinus. She is up and about, her condition, however, is not promising. The discharge is considerable, and I should like to ask when it would be advisable to again open her abdomen to relieve the condition that is causing this suppuration.

Dr. Louis Frank, Louisville.—It strikes me that most of these questions have been definitely settled. There is not and should not be any further question as to the advisability of vaginal drainage in acute pus collections as a temporary expedient. However, my experience has been different from that of most of the gentlemen who have spoken on the subject, in that I have found in some cases this measure did not answer, and that abdominal section had to be resorted to. I have in mind now one instance of pus collection between the bladder and the uterus where fever continued acutely high after primary vaginal colpotomy.

I would like to call attention to that class of cases operative in character in which we find the abscesses mentioned by Dr. Goldspohn, where there may be infection of the tube and broad ligament and in which the symptoms do not subside after the mere opening of the abscesses. I have met with such cases, as I am sure other gentlemen have, which have yielded only to extirpation of the tube and removal of the broad ligament itself following vaginal colpotomy, that is, in acute infectious lesions.

I do not think enough stress has been laid upon the point brought out by Dr. Bonifield as to resection of the entire length of the tube, in operations done through the abdomen where it is desirable to conserve the uterus. Failure to do this is responsible for many secondary operations in so-called conservative work. True conservatism consists in removing absolutely all of these diseased structures. We cannot lay down any hard and fast rule as to what we may conserve; it is largely a question of personal experience, and my own experience has been that in those cases in which I attempted to conserve too much I have met with disappointment in many of them. I believe with Dr. Bonifield that the truest conservatism consists in removing the disease absolutely. It is far better in the particular class of cases he refers to to remove a tube or an ovary, if there is any likelihood of future danger than to take the risk by saving a portion of a tube or portion of an ovary.

Dr. Albert Goldspohn, Chicago.—May I add a few explanatory remarks to what I have already said? In speaking clinically of cases suitable for vaginal incision and drainage, I would specify that this treatment is not applicable to the conditions such as are ordinarily obtained from gonorrheal infection. This produces salpingitis and pelvic peritonitis, but not pelvic cellulitis.

With reference to not operating on the acute cases, letting them go on and become subacute, one great difficulty we meet there is to make the diagnosis between appendicitis and salpingitis or ovaritis on the right side. I am well satisfied from what I have heard incidentally from surgeons around me, and the kind of cases they operate on for appendicitis, that young girls, grown children, are operated for appendicitis who have not that disorder, but inflamed or painful uterine adnexæ of the right side, which should not be operated for at all or only after longer medical treatment. If the trouble is really appendiceal, we cannot take any chances; we should operate without delay usually, but if we can make out by bimanual palpation and the history of the case, chiefly by bimanual palpation, that the trouble is probably from a uterine or genital source, and not appendicitis, the case may not need operation. It is to avoid this mistake that men, who, after previous training in careful bimanual palpation and by constant daily practice of it, develop that all-important sense of touch in their fingers, should operate or treat appendicitis in females as belonging to gynecology.

Dr. Joseph H. Branham, Baltimore.—It seems to me the primary point brought out by the paper has not been entirely cleared up. Pelvic inflammation is very much like inflammation in other parts of the body. We all know that the cause of inflammation is some germ; but we seem to forget that the degree of virulence of the infecting agent varies so much that it can hardly be estimated; that the infection in one case will be with a germ that is naturally of low virulence, and then the same germ under different conditions and in different instances shows the very greatest difference in the amount of virulence. When a patient has a pelvic inflammation, what is the object of treatment? We try to cure the patient without mutilation. I think everybody will agree to this. How are we going to do it? If we are certain the patient has an infected tube, we do not always operate. We know the patient has gonorrhea, that she has a tender and sore tube or two tender and sore tubes that are infected; we put her to bed, give her rest, and if her phagocytes are strong, they clear up the condition, and the patient often gets well without operation. I have seen such patients bear children afterward.

The next case is worse; the infection is severe, and there are indications of pus in considerable quantities. In such a case we open the culdesac and put in a drain, doing it early. This is absolutely conservative treatment. If we open up the culdesac, and, if necessary, with finger open up the ends of the tubes, or

even puncture the tubes in the early stage, drain thoroughly and freely, and continue it for some time, a large proportion of the patients get well, no matter what the infection is, provided the mucous membrane of the tube has not been destroyed. Drainage in these cases, if done early, is the greatest of all conservative operations the gynecologist can do, in my opinion. Even if the patient is suffering from acute inflammation and the condition is dangerous, drainage is the best method of treatment. There is one objection to drainage, however, in these cases, and that is when you conscientiously drain [in acute abscesses, which we all agree is the proper thing, no matter what the cause, with the distinct understanding that if the inflammatory process has gone so far as actually to destroy the mucosa of the Fallopian tube, a secondary operation will probably be necessary; a good many of the patients go to somebody else for a secondary operation. If the inflammatory condition has gone on to the stage where the infective agents in the tubes or in the pelvis have ceased to be virulent, where the pus has become sterile, where the adhesions and other causes serve to make operation necessary, then, of course, the abdominal route for the removal of the diseased organs is best; but I think early drainage in pelvic abscess, no matter what the cause, will save a great many tubes by allowing the pus to escape. We all know that pent-up pus destroys the organ in which it is situated.

Dr. Smith (closing the discussion).—I shall not detain you by any extended remarks in closing. I am glad the position which I have taken has been indorsed in the main by the older and more experienced members of the Association. This is the first paper I have presented to you, and it is pleasant to have one's opinions backed up by such distinguished gentlemen. I am particularly pleased with Dr. Bonifield's stand in regard to the removal of both tubes where only one is diseased. I know it has been and is still being taught that in cases of gonorrheal pyosalpinx, even though but one tube is found to contain pus, the other tube should also be removed. This has been taught quite extensively, but I have not been able to convince myself of the necessity of removing the healthy oviduct in these cases, even though there is gonorrhea. I think a careful and thorough curetment of the uterus, with which I always precede the radical operation, and a complete exsection of the diseased tube will result in a permanent cure, and that it is seldom necessary to take out a healthy Fallopian tube even in cases of known gonorrheal origin.

ABDOMINAL SURGERY WITHOUT DETACHED PADS OR SPONGES.

A Simple, Certain and Universally Applicable Method of Preventing the Serious Accident of Leaving a Sponge in the Abdomen.

BY
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St. Louis.

(With six illustrations.)

A SPONGE left in the peritoneal cavity following an operation constitutes one of the most deplorable accidents of abdominal surgery. This is not a new subject. As you are well aware, much has been written upon it and many cases have been reported and many suggestions have been made as to preventive measures. But all such measures hitherto proposed have broken down under the varied circumstances and vicissitudes of surgical work, as evidenced by the records subsequently cited.

The continued occurrence of this fatal accident and the failure of the preventive methods in general use constitute sufficient reason for my calling attention to a method which I have used with much satisfaction for the past two years. This method gives entire security and at the same time is simple and inexpensive and is effective in all conditions of abdominal work—in the emergency operation in the country with unfamiliar assistants, as well as in the routine hospital work. Before taking up the details of this method, however, I wish to call attention to certain facts in regard to the accident it is designed to prevent, so as to bring out more clearly the seriousness of the accident and the difficulties encountered in its prevention.

1. Sponges are lost in the peritoneal cavity much more frequently than is generally supposed. The table given later shows 172 authenticated cases in which one or more sponges were lost in the cavity. And these reported cases represent only a small proportion of the recognized cases, for, naturally, the accident is not given publicity except where there is some special reason for doing so. In any large body of surgeons a little experience meeting, in which testimonies are freely given, will bring to light a number of unreported cases of this accident.

Furthermore, many cases are not even recognized. The patient dies with evidence of peritonitis; there is no suspicion of any foreign body having been left in the abdomen, no postmortem examination is made and the death is supposed to be due to ordinary peritonitis. The possibilities in this direction are indicated by the fact that in the series mentioned, in thirty-nine of the cases the accident was recognized only on postmortem examination, when the sponge was found, but would have remained unknown had there been no autopsy.

2. It is a most serious accident. In the large series of cases collected more than one-fourth of the patients died, and of those who recovered many went through weeks and months of suffering.

3. To persons outside the profession the accident seems absolutely inexcusable. They can understand how other complications may arise, such as hemorrhage or sepsis or kidney failure in spite of every precaution, but they can imagine no reasonable excuse for allowing a sponge to be lost in the patient's interior. To those not familiar with surgical work it seems past belief that the surgeon would carry into the peritoneal cavity anything the removal of which was not provided for with absolute certainty.

The growing cognizance of the public in regard to the occurrence of this accident and the feeling in regard to the responsibility for it are reflected in the increasing number of lawsuits connected therewith. In the latter part of this article is a list of lawsuits from this cause found in a partial search of literature. Within the last few months, two such lawsuits in a single State have come to my notice. Last March the following newspaper notice concerning a suit in Des Moines, Ia., was sent to me by a St. Louis physician who was personally acquainted with the defendants. "Damages to the extent of $1500 were awarded to Etta Reynolds by the jury this afternoon. Miss Reynolds sued Drs. Schooler and Smith for leaving a piece of gauze sixteen inches square in her abdomen after an operation."

In casually reading the St. Louis *Republic* for May 30, I happened to notice the following news item: "Davenport, Ia., May 29. After being out forty-eight hours, the jury in the $50,000 damage case of Mrs. Annie Arp, against Dr. A. L. Hageboeck, Dr. J. T. Haller and Dr. J. H. Meyhaus, reported they were unable to agree and were discharged. The jury stood 11 to 1 in favor of awarding Mrs. Arp damages. The case was first tried a year ago, when the jury also disagreed and stood the same, 11 to 1 for the plaintiff. The defendant doctors are charged with

having left a surgeon's sponge in the body of John Arp, husband of the plaintiff, at the time they performed an operation for appendicitis. This caused abscess which resulted in death."

4. There has hitherto been no sure preventive method which was applicable in all the circumstances of abdominal surgery. The list of preventive measures recorded later shows that much thought has been given to devising means for preventing this accident. Rules interminable have been proposed, and expensive and cumbersome racks and stands devised for the purpose. Not one of these devices, however, has proven absolutely safe, for the reason that, in their use, the certain removal of all sponges carried into the abdomen depends on the studied attention of the operator or on a system of attentive cooperation among assistants or nurses. While such attentive cooperation is entirely feasible under ideal conditions and with ideal persons, the fact remains that it is not secured and is not likely to be secured under the variable circumstances of abdominal work. The many emergencies which arise in the course of abdominal operations, the changing assistants and nurses, the hurried operations at night in the hospital with short help, the operations in private homes where the patient cannot be gotten to the hospital at all—all these conditions play havoc with safety arrangements depending upon a nicely-balanced system of rules and cooperation or on the use of cumbersome racks or stands.

There is not time here to take up in detail the various ways in which mistakes have occurred; suffice it to say that a review of the cases where dependence was placed on counting shows an appalling list in which a sponge was left, because one was hastily torn in two and one-half forgotten, or an extra one was primarily included in the bundle and missed in the counting, or an extra one was secured for an emergency during the operation, or some loose piece of gauze, not intended for intraperitoneal use, slipped in while near the wound, or a mistake was made in the final count of the sponges removed. It is astonishing what a little slip, what a slight inattention, may lead to a sponge being left and the consequent death of the patient.

The method of attaching a tape to each sponge and then fastening a forceps to the tape and at the same time to the abdominal sheet, is the method probably in most general use. It has a record of many accidents—the tape pulled off the sponge, or there was failure to attach the forceps, or the forceps failed to

hold well. In one case the sponge, tape and forceps were all lost in the cavity.

The difficulty of guarding absolutely against leaving a sponge in the abdomen is such that entire security against this fatal accident is counted one of the unsolved problems of abdominal work. Practically all writers on the subject state that there is no guaranty against its occurrence, even in routine hospital work and with all the rules of cooperation and the special apparatus designed to prevent it. Neugebauer, in a most exhaustive consideration of the subject, comes to the conclusion that the accident is, to a certain extent, unavoidable. Schachner, in an excellent paper, states, "So long as surgery continues an art, just so long will foreign bodies continue to be unintentionally left in the abdominal cavity." In an article published in August Findley states, "In former years, the abdominal surgeon was seriously disturbed by well-grounded fears of secondary hemorrhage and sepsis, but surgery has mastered these problems to a large degree and they are little feared and seldom experienced. Now it is the thoughts of the sponge that disturb the night's repose when the report comes that something has gone wrong with our patient. The operator can never rid himself of the feeling of uncertainty as to the possibility of leaving a sponge." This expresses very well the feeling of those who have given attention to this subject, and particularly of those who have personally experienced the accident and have thus been brought face to face with a concrete exemplification of the inadequacy of the usual methods.

The failure of the safety methods in general use is due to their dependence upon *sustained attention* concerning the sponges, which attention on the part of the surgeon cannot be given to the sponges, for it is required elsewhere. A method, to be effective under all circumstances, must be practically *automatic*. It must also be applicable in emergency work in the country as well as in hospital work and it should be fairly convenient. The method I have used for the past two years is such a one, insuring the removal of all gauze without particular attention on the part of anyone.

THE METHOD.

The underlying principle of this method is the elimination of all detached pads and sponges. In place of them I use long strips of gauze, each strip packed into a small bag in such a way

that it may be drawn out a little at a time as needed. The method was described in detail last September and it was demonstrated before the St. Louis Medical Society in February of this year. It is from the latter description that the following quotations are made.

Following the usual technic, I operated for years without accident; but three years ago, I left a gauze pad in the abdomen. The case was one of diffuse pelvic suppuration requiring extensive drainage and, fortunately, the pad was discovered and extracted through the drainage opening about two weeks later. "The patient recovered without serious result from the accident, but the lesson was not lost. I determined to find some method that would really prevent such an accident—a method which would be entirely under the control of the operator and first assistant (a greater division of responsibility increases the danger) and one which would occasion no delay in the closing steps of the operation.

"There had to be taken into consideration the large pads for holding the intestines out of the way and the small pads and gauze pieces for sponging. In place of several large pads for packing back the intestines, I adopted the large roll of gauze, then in use by a number of operators, and found it satisfactory.

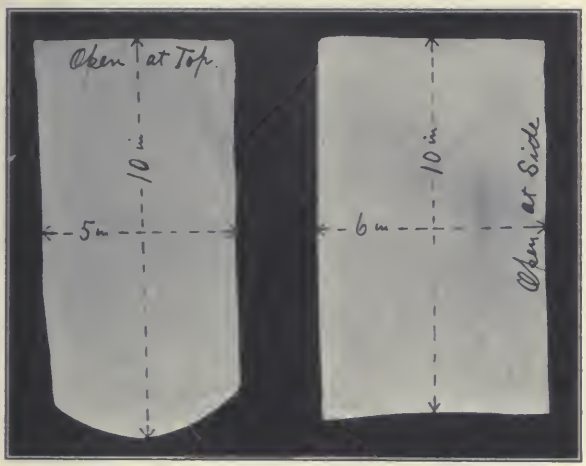
"The matter of the small pads and sponges, however, was not so easily disposed of. I felt that it was imperative to find some method that would do away entirely with dependence on the counting of the sponges at the close of the operation. As long as there was dependence on counting of the numerous small pads and sponges there would be mistakes, and consequently sponges would occasionally be left in the cavity.

"To eliminate this hazardous dependence on counting and to provide a method that would make the leaving of a sponge in the abdomen practically impossible was not an easy task. I worked over the problem for the greater part of a year. I tried various methods in common use for keeping track of the small pads and sponges, such as clamping an artery forceps to a tape attached to each sponge, attaching a heavy ring to each tape before sterilization, clamping each tape or a corner of each sponge to the sterile sheet about the wound and the like. But I found no such method that was practical under all circumstances and absolutely safe.

"It then became evident to me that if safety were to be secured, the detached pads and sponges must be eliminated entirely.

In pursuance of that idea I devised the method here described. The principle of this method is that no detached piece of gauze shall enter the abdominal cavity. Each piece of gauze introduced for sponging is simply part of a very long piece, the greater part of which is always outside the cavity."

To make assurance doubly sure, I have recently put the large roll of gauze above mentioned into a bag, similar to the bags for the narrow strips, except that it is open on the side. As now used, therefore, the set of gauze strips for abdominal section



A B

FIG. 1.—The Cloth Bags Empty. A. Bag for each Narrow Strip. It is five inches wide and ten inches deep, and is open at the top. It is made of extra heavy muslin and is sewed with French seams, so that there is no chance for any raveling to be pulled out with the gauze. B. Bag for the Wide Strip. It is six inches by ten inches, and is open at the side. This bag is the same as those for the narrow strip except that it is one inch wider and is open at the side instead of at the end.

consists of four narrow strips for sponging and one wide strip for packing back the intestines. Each *narrow strip* consists of a piece of gauze ten yards long and a half yard wide. This is folded lengthwise so as to make six thicknesses. The folded strip is approximately three inches wide and ten yards long, with raw edges turned in and the ends tacked with thread to keep it from unfolding. The bag for each narrrow strip is five inches wide and ten inches deep and is preferably made of extra heavy material and is sewed in such a way that there is no chance for a raveling to be pulled out with the gauze.

"Beginning with one end, the gauze strip is packed firmly, a little at a time, into the bag. When the end of the strip is introduced to the bottom of the bag, it is to be fastened there by stitching through and through, so that if by any possibility the whole strip should be packed into the abdomen (to

FIG. 2.—Packing the Narrow Strip into the bag. The end of the strip is caught with a forceps and carried to the bottom of the bag, where it is fastened securely by sewing through and through, and then successive portions are rapidly packed in with the forceps. When packed in thus, the gauze strip may be drawn out a little at a time as needed.

check a sudden severe hemorrhage or for other reason) the end would still remain securely fastened outside. When all the strip has been packed into the bag, the top of the bag is closed by folding over and a large safety-pin is attached to the bottom of the bag. This safety-pin is for use later to fasten the

bottom of the bag to the abdominal sheet. It should be large, so that it will be strong and easily handled. Four of these filled bags belong in each abdominal-section set.

"The *wide strip* consists of a piece of gauze five yards long and one yard wide. This is folded lengthwise to make four thicknesses. The folded strip is approximately nine inches wide and five yards long. The bag for the wide strip is ten inches by six inches and open at the side instead of at the end. The end of

FIG. 3.—The Wide Strip folded and ready to put in the bag. One end of the strip is first introduced to the bottom of the bag and fastened there securely by sewing through and through. Then the whole strip, folded as shown, is placed in the bag. When the strip is folded in this way it will, when pulled upon, come out as a wide strip, suitable for packing back the intestines (see Fig. 6).

the strip is then fastened securely in the bottom of the bag by stitching through and through, and the folded strip is placed in the bag in such a way that when pulled upon it will come out a little at a time as a wide strip. The open side of the bag is closed and pinned with two safety-pins, which are used later for pinning the corners of the bag to the abdominal sheet. One wide strip and four narrow strips constitute one set. The narrow strip is used for sponging, for walling off small areas and for all purposes for which small pads and sponges are ordi-

narily used. The wide strip is used for packing back the intestines, walling off large areas and all purposes for which large pads are ordinarily used.

"At the operation, the lower end of a bag containing a narrow strip is pinned to the sterile sheet a sufficient distance away to bring the mouth of the bag conveniently near the wound, but not in the way. If desired, the upper end also may be pinned to the sheet. The gauze strip is used as a sponge by catching a small part of it with the fingers or with forceps and pulling it out of the bag as required and then sponging in the abdomen. After use, this part is dropped away from the wound and another

A B

FIG. 4.—A Set of Gauze Strip Sponges. A. Four Narrow Strips. The safety-pin at the bottom of each bag is for fastening the bag to the abdominal sheet (see Fig. 6). B. Wide Strip. The two safety-pins closing the bag are used later for fastening the corners of the bag to the abdominal sheet (see Fig. 6).

small part is drawn out and used. The used part is *not* cut off, but simply dropped outside the operative field and, as more and more of a strip is used, this soiled part falls off the table and out of the way. Thus the greater part of the strip is always outside the abdominal cavity. No detached pieces of gauze are used in the cavity, and hence none can be left here.

Usually two strips, one placed on each side at the beginning of the operation, are used in the course of an ordinary abdominal section. In cases where there is but little sponging, only one strip is needed. In very extensive operations where an extra amount of sponging is required, three or four strips may be needed. In no case did I find it necessary to use more gauze than that contained in one set, though I always have an extra set sterilized

and ready for use. I tried different lengths and widths of strips, and prefer the size here given. When ready to pack back the intestines out of the operative field, the bag containing the wide strip is wrung out of hot saline solution, laid on the abdomen, two corners pinned to the abdominal sheet, and the wide strip is then drawn out as needed to push the intestines out of the way and wall-off the involved area."

FIG. 5.—Method of Using the Gauze Strips. Just before the incision is made, a bag containing a Narrow Strip is fastened at the side of the abdomen by pinning the bottom of the bag to the sterile sheet. If desired, the top of the bag may be pinned in like manner. The mouth of the bag lies conveniently near the wound, but not in the way. The end of the gauze strip is caught with the forceps or fingers and pulled out as needed for sponging, as here indicated. In a case where but little sponging is required, one bag will be sufficient. In a case where more sponging is likely to be required, it is well to fasten a bag on each side of the abdomen at the beginning of the operation. [For photographing, the checked toweling was used instead of the usual white abdominal sheet so as to show the white bag and strip better by contrast.]

I use these gauze strips exclusively in all my abdominal-section work from the time the skin is incised until the peritoneal cavity is closed. At first I anticipated considerable tangling of the gauze strips about the forceps in the wound, but found that that could be easily avoided by always dropping the soiled portion of the strip *outside the field close to the bag.* This prevents

the accumulation of loose folds about the wound, with which the instruments may become entangled.

So far as I know, the method is original, no description or use of such having come to my notice. The nearest approach to it that I have seen is the recommendation of some writers that a

FIG. 6.—Method of Using the Gauze Strips. As fresh portions of the strip are drawn out for use the soiled portions are *not* cut off, but simply dropped down beside the bag and off the table. It is the *continuity* of the strip that insures safety, hence the trip should not be cut during the course of an operation. Troublesome accumulation of folds of the strip about the wound (with consequent tangling with instruments, may be prevented by always dropping the soiled portion outside the field clos to the bag, as here shown. This photograph hows also the Wide Strip in place, ready to be used for packing back the intestines or walling-off a large area or any other purpose for which large pads are ordinarily used. The bag containing the wide strip is preferably wrung out of hot saline solution just before use. It is then laid on the abdomen, opened, two corners pinned to the abdominal sheet, as here shown, and the strip drawn out as required. No detached pads or other pieces of gauze are allowed about the operative field, hence none can be carried into the abdominal cavity to be left there.

part of every abdominal pad and sponge should always be kept outside the cavity. For some years the large roll of gauze for packing back the intestines has been used by many operators, also gauze strips of various widths and lengths (including five-yard and ten-yard lengths) have been in general use in abdominal

surgery for tamponade to check bleeding. But that is very different from the method here detailed of using long strips systematically so as to eliminate all detached pads and sponges.

It is the packing of each long strip into a bag that makes this use of strip-gauze practical and convenient—the small cloth bag confining the long strip in a small space so it is not in the way. Having used this method now for two years in various kinds of abdominal cases and under differing environment, I feel justified in recommending it as safe, practical and convenient. It simplifies the matter of pads and sponges for abdominal section and eliminates entirely the chance of leaving a piece of gauze in the abdomen.

Special Points.—It may be of interest to take up briefly some special points in regard to the use of the gauze-strip sponges and some possible criticisms that have been brought out in my study of the subject and in questions asked me by surgeons contemplating the use of the method. Most of these points were considered when the method was demonstrated before our local society, and much that is here given in regard to them is from that report.

In the first place, the object of this method is not convenience, but *safety*. Its existence depends solely upon the desire to eliminate every chance of leaving a piece of gauze in the abdomen. Incidentally, the method has been developed in such a way that it is convenient—in some particulars more convenient than the ordinary detached sponges. But this convenience is only incidental. I call particular attention to this point for the reason that the simplicity of the method and its convenience in certain particulars (ease of preparation, compactness, sponge always within reach of both operator and assistant) have caused some to jump to the conclusion that its simplicity and convenience constitute the reason for its promulgation. That is a mistake. The time and study required for the development of this method were given only because of the pressing necessity of finding some universally applicable method that would make practically impossible the serious accident of leaving a sponge in the peritoneal cavity. The pads and sponges commonly used in abdominal work are fairly convenient. On that score no decided objection can be laid against them—certainly none of sufficient weight to justify the radical change here contemplated from the long-tried and generally employed technic of abdominal

surgery. The fatal drawback to the ordinary pads and sponges is the danger of one being left behind.

"*Do not the methods in general use give practical safety?*"—The facts previously mentioned and the table of cases subsequently given answer that question to a large extent. Hitherto there has not been a method, practically applicable in all the vicissitudes of abdominal surgery, which would entirely prevent this accident. Practically all authorities state that it is to a certain extent unavoidable. Notwithstanding all the methods hitherto proposed, many lives are still being sacrificed to this accident. In spite of widespread interest in the subject in recent years and of much study and investigation of it and several excellent papers by different authorities, there has been no signal advance. Ten years ago operators were using the same preventive measures now commonly employed. The sponges were counted, tapes were attached to the sponges that were counted, forceps were attached to the tapes that were attached to the sponges that were counted, etc., etc. Yet with all these complicated precautions, many sponges were left in the cavity, as the records show.

Of course, where a surgeon always operates in the same hospital with the same assistants and to a large extent with the same nurses month after month, the danger is reduced to a minimum because of the establishment of a routine from which there is almost no departure. Even under these circumstances, however, the danger is not entirely eliminated. And what of the great bulk of surgical work, where the operator works at different hospitals, with different nurses and in some cases with changing assistants! Furthermore, the progress of the operation is not always smooth and regular. Abdominal surgery is notably full of uncertainties, unlooked-for developments and trying situations, that break the routine of the best regulated institutions and tax to the utmost the ability and steadiness and attention of all concerned in the operation. And, still further, think of the emergency work, in unsuitable environment and with untrained assistants! In estimating the possibility of this accident, all these conditions must be taken into consideration. Likewise, all these conditions had to be considered in devising a method for preventing the accident. To be suitable for general use, the method must be absolutely safe under all these varied conditions.

There are several methods that would be fairly safe under ideal conditions and when everything progressed smoothly.

But it is only a fractional part of abdominal surgery that is conducted under ideal conditions—with assistants, nurses, material and routine all prfectly adapted to the work in hand and to each other. As far as I have been able to ascertain, every method previously proposed has broken down absolutely under the vicissitudes of abdominal surgery under usual conditions. And this failure has not been due to inexcusable carelessness and lack of common judgment, but to the fact that under the emergencies of actual work, it is impossible to watch everything and to follow all the details of the nice routine required by these methods. The racks for receiving sponges or the hooks on the walls (where there is a hook for every sponge and at the end must be a sponge for every hook) or the permanent attachment of a heavy ring to a tape on each sponge or other complicated methods may work very well in a perfectly arranged institution, but they will never permeate the bulk of abdominal surgical work.

The method which has received the most general adoption, of attaching a tape to each sponge and an artery forceps to each tape and perhaps clamping tape to the sterile sheet, depends too much on attention to details and watchfulness on the part of the surgeon and assistants to be safe. If we could always depend on everyone doing their full duty and on the "tracers," as the tapes are sometimes called, never pulling off of a sponge, very well. But abdominal surgery is not a smooth and easy form of work, and surgeons and assistants and nurses are not perfect human beings. Any method that is built on the supposition that the operation will always go along without any great emergency and without mistakes, is bound to fail sooner or later. With the use of tapes and forceps, many sponges have been left in the abdomen. We must deal with facts, not simply with nice theories.

"*Is the gauze strip method absolutely safe under adverse conditions?*"—Yes, it is practically automatic. I am convinced that we have a really safe and practical method in the simple one here detailed. I did not arrive at this conclusion hastily, but tried the method a full year before recommending it. I have used it now for two years in various classes of abdominal-section work and in differing environment, and the longer I use it the better I like it. Even if it were decidedly less convenient than the regular pads and sponges, I should consider its use imperative because of its safety. The greater part of the strip is always outside the abdomen and if, by any possibility, the whole strip, ten yards in length, should be hastily packed into

the abdomen to check oozing, the end would still remain out, for it is fastened securely to the bag and the bag to the sterile sheet. I do not see how there is any practical possibility of a piece of gauze being left in the abdomen, even in the most trying case and with wholly untrained assistants. The hazardous dependence on the final counting or on watching what goes in and what comes out of the cavity is entirely eliminated.

The great value of this method is in the *automatic* feature. In clearing the wound for suturing, every particle of gauze is necessarily removed from the cavity without particular attention on the part of anyone. It largely eliminates the human equation, and it is in that direction that safety lies.

"*Is not the strip of gauze extending from the forceps to the bag inconvenient and in the way when sponging?*"—Sometimes it is in the way to a slight extent, but not as much as would at first appear. Any new method seems somewhat awkward at first, and this is no exception to the rule. However, in my experience so far, I have not found any situation in which there was serious interference with satisfactory sponging or with any other operative manipulation. Like any other important step in technic, it should be studied until it is clearly understood before an attempt is made to use it. There are two particular points that may be mentioned. To prevent the accumulation of loose folds of gauze in the vicinity of the wound, with consequent entangling of the instruments, the used portion of the strip should always be dropped outside the field, but close to the bag. Again, when taking hold of a fold, to sponge with, draw it out of the bag for some distance, so that it can be introduced into the abdomen as far as desired freely and without tension.

"*Is not the size of the opening reduced to a troublesome extent by the wide gauze strip?*"—The wide strip extends out of the upper angle of the wound after the intestines are walled off and takes up but little room. In my experience it has not been troublesome. I can understand that with a very small opening it might be in the way. But in the opening of ordinary size, which gives free access to the structures involved and admits of accurate and unhampered work, the strip causes no particular inconvenience.

A very small incision seems attractive to some surgeons, but the more abdominal work I do and the more I see of intra-abdominal conditions, the more firmly convinced I am that it is a serious mistake to attempt to deal with such lesions through a

small incision, that will not admit of accurate investigation by sight as well as touch. The scar should, of course, be as small as is consistent with effective work. The object of the operation, however, is not a pretty scar, but restoration to health by the accurate, safe and thorough treatment of the serious lesion within.

"*Does the cloth bag sufficiently protect the contained strip from contamination from external sources during the operation?*"—There is no need of particular protection, for everything about the operative field is sterile—the abdominal sheet to which the bag is fastened, the operating gown, the rubber gloves on the hands—everything that comes in contact with the bag.

"*What if the bag and its contents become contaminated with pus from within the abdomen?*"—Proceed the same as when the ordinary detached pad became soiled,—namely, remove the soiled bag or cover it, and apply a fresh one. "Would not several partly filled bags be thus thrown away in the course of operation on a pus case?" I have not found that to be the case. Such contamination takes place, as a rule, but once during an operation. If it is a case where contamination takes place to some extent all through the operation, usually the bag, like the ordinary pads, is not changed until ready to clear the field for closing. The wound and surroundings are then cleansed and fresh towels and bag put in place for the final steps of the operation.

In asking the above question, it was suggested that possibly rubber bags or metal cases would be better than the canvas bags. But I do not think so. They could not entirely protect the contained strip from pus, for the end must be open, and they would be clumsy and expensive—increasing the cost of the method without conferring any real advantage. With the simple materials I have used, the method is within the reach of anyone in any situation, and that is an important matter in any method that is recommended for general adoption.

"*Why not cut off the used portion of gauze?*"—There is a rule which should be most strictly observed, namely, never cut a gauze-strip sponge in the course of an operation. The temptation to cut the strip comes not infrequently, because in certain situations it makes the sponging somewhat more convenient. In some situations the cutting would, of course, not be dangerous, as when part of the strip outside is cut off and allowed to drop away. On the other hand, in other situations the cutting of the strip might lead to a portion being left, as when a part is used for

temporary packing and then the strip is cut in order to sponge more conveniently with the remainder. Whenever a cut is made in one situation for any reason, the rule is broken, and then a cut is likely to be made on the spur of the moment in any other situation where it appears to increase the convenience, and thus absolutely security is lost. The only safe plan is to adhere strictly to the rule never to cut a strip during the course of an operation. Of course, if at the close of an operation it is desired to use part of a strip for permanent packing or drainage, that is a different matter.

Another question that has been put to me is as to the *size* of the strips. I experimented with different sizes. Those used at first were much narrower. When such a narrow strip is wet with blood it becomes like a ribbon—not enough substance in it to sponge well. Of the various sizes tried, I found ten-yard strips, half a yard wide, the most convenient. Folded as indicated, such a strip is narrow enough for use when a very small sponge is required; while, on the other hand, several folds caught in the forceps furnish the substance for a large sponge. Also, it can be easily spread out sufficiently to wall off an object with sheet gauze, as, for example, in surrounding the region of the appendix when that structure is to be removed. When the gauze used in making the strips is extraordinarily thin, the width should be doubled.

I have been asked about the *cost* of this method. Preventing, as it does, one of the most serious accidents of abdominal surgery, it is cheap at any price. Even though its use cost several times as much as the dangerous detached sponges, that would not constitute a valid objection. As a matter of fact, however, it costs no more than the usual method; if any difference, the cost is somewhat less. In order to get definite information on this point, I ascertained the amount of gauze generally used in an ordinary abdominal section in each of four of our leading hospitals. Though the number and size of the pads and sponges differed greatly in the different institutions, there was a striking uniformity in the amount of gauze consumed in an ordinary abdominal section—averaging 20 to 25 yards in each institution. The amount ordinarily used in the method which I have detailed is 15 yards—the 5 yard roll for packing back the intestines and 10 yards in the two gauze strips in bags. In severe cases the third gauze strip is used. Even if the whole set were used, it would not run over the amount consumed by the usual method.

I have been asked if, in using this method, it is necessary to take one's own sponges to the different hospitals. Not at all. Where the operating-room nurse is not familiar with the method, she is given, a day or two before the operation, a slip containing definite directions for preparing the strips and bags.

Nurses, as a rule, welcome the method, stating that it is less troublesome than the sewing of the numerous small pads and sponges. The directions to the nurse are as follows:

GAUZE-STRIP SPONGES FOR ABDOMINAL SECTION.

Four narrow strips—10 yds. long, 3 in. wide—6 thicknesses.
One wide strip—5 yds. long, 9 in. wide—4 thicknesses.
Have another set (four narrow and one wide) in reserve.

For the Narrow Strips, the yard-width of gauze is divided into two strips, and each of these when folded to six thicknesses, is about three inches wide. For the Wide Strip, the full yard-width of gauze is used—when folded to four thicknesses it is nine inches wide. Turn in all raw edges so that no raveling can be left in the abdominal cavity.

Pack each Narrow Strip into a separate small cloth bag, 5 in. wide and 10 in. deep, and attach a large safety-pin to the bottom of the bag. The safety-pin is to pin the bottom of the bag to the abdominal sheet at operation. Make the bag of extra heavy muslin or drilling and sew with French seams to avoid ravelings on the inside. The end of the strip first introduced to bottom of the bag should be fastened there securely by stitching through and through. Then pack the strip firmly into the bag in such a way that it will come out easily, a little at a time as needed. Four of these filled bags belong in each set.

For holding the Wide Strip, use a bag 6 in. by 10 in. and open on the side, instead of at the end. Fold the strip back and forth, thus forming a narrow pile about three inches wide (see Fig. 3). Fasten one end of the strip securely to the bottom of the bag by sewing through and through. Then place the folded strip in the bag in such a way that, when pulled upon it will come out, a little at a time, as a wide strip suitable for packing back the intestines. Fold over the open side of bag and pin with two large safety-pins. The safety-pins are for fastening two corners of the bag to the abdominal sheet (Fig. 6).

One wide strip and four narrow strips constitute one set and are to be wrapped together in a cloth for sterilization in the usual way. Have also an extra sterilized set in reserve. At the operation the bag containing the wide strip is to be placed in hot normal saline solution. The narrow strips are to be used dry.

The above simple preparation provides all the pads and sponges required for abdominal section and, as used at the

operation, the sponge is always within instant reach of the operator. The advantage of always having the sponge within instant reach will be particularly appreciated by those who have been obliged to handle serious and troublesome intra-abdominal conditions without trained assistants. The gauze strips may be used also for temporary packing to check hemorrhage or for any other purpose for which strip gauze may be required in the course of an operation.

At the end of this paper is given a table including two hundred and forty reported cases of a foreign body lost in the abdominal cavity. The table includes only cases in which the abdominal cavity was involved. A number of cases given in other collections of foreign bodies left after operation were excluded because the operation nvolved the breast, neck, hip, etc., instead of the abdominal cavity. Other cases were excluded because the sponge or forceps was found before the abdomen was closed. Still others were excluded because they were probably or possibly repeats. About thirty cases in all were thus excluded.

No particular effort was made to secure a large number of cases to date, by a prolonged search of literature nor by writing to surgeons for a list of personal cases. A few recorded cases, more or less, make little difference, for these recorded cases represent only a small proportion of the total number of such accidents. My object, therefore, is not so much to present a long list or a complete list as to present a quick survey of authenticated cases of such variety and number that the careful surgeon will be led to pause and think on this matter.

A sponge is the article most frequently left in the peritoneal cavity, but in about one-fourth of the recorded cases the article left was a forceps or piece of an instrument or other small object used about the wound. This calls attention forcibly to the fact that small instruments should not be allowed about an open abdominal wound. Neugebauer long ago called attention to this danger of small instruments, and urged the use of long instruments exclusively in abdominal work.

Many surgeons have adopted this safety measure, but there are many others who seem to give no thought to the matter, and continue to use numerous small instruments in this dangerous locality. It may not be possible at present to entirely prevent the accident of leaving some article of the surgical armamentarium in the abdomen, but it is possible to reduce the danger to a minimum by the use of long instruments exclusively, and it

seems to me that all those who are engaged in abdominal surgery should be led by common prudence to adopt this simple expedient. The details, as carried out in my own work, were mentioned in a previous article as follows: "Every instrument used about the wound is long—so long that a portion of it is practically always outside the abdominal cavity. Again, if by accident such an instrument should slip entirely into the cavity, its length is such that it would almost certainly be felt when the hand is carried into the cavity for the final palpation before closing. All the artery-forceps, dissecting-forceps, tenaculum-forceps, pedicle needles, scissors and other instruments for internal work are from six and a half to eight inches long, the shortest being the large dissecting scissors (six and one-half inches). The shortest instrument used anywhere about the wound is the scalpel (six inches), which is laid aside as soon as the peritoneal cavity is open. The needles and Murphy buttons are not brought near the wound, except when held with a forceps or with a suture attached. No Michel clamps (for holding rubber tissue or gauze along the wound margin) or other small unattached objects are allowed near the wound as long as the peritoneal cavity is open."

LEGAL COMPLICATIONS.

Lawsuit. Small gauze strip extracted from abdominal sinus.—In a case of retroflexion, Wiggin (18) did a vaginal fixation and also removed the left ovary. Suppuration followed, presumably from the stump. Later, laparotomy was performed for the removal of the ligatures. This was followed by an abscess in the abdominal wall and a persistent sinus. The patient then went to another institution, and later a small gauze strip was taken from the sinus. Suit was entered for $10,000.

Dr. Wiggin contended that the gauze was not the kind he used in sponging and that the small strip had probably been left in the sinus while the patient was being dressed at the other institution. Verdict for the defendant.

Lawsuit. Fragments of sea sponge discharged from abdominal sinus.—Patient was subjected to laparotomy by Roesger(21). The wound healed and the patient was discharged in eighteen days. Four weeks later a sinus developed in the scar. A silk thread was extracted from this, and it healed. Later, a second sinus developed near the location of the first. The patient was hysterical and impatient, and placed herself under the care of another

practitioner. Five months afterward, the latter showed Roesger several particles of sponge which had come out of the second fistula. Suit was entered for 15,000 marks.

The decision rested entirely upon the question as to whether or not the retention of sponge fragments could have been avoided. Much expert testimony was introduced. The verdict was for the defendant, it being held that when a physician had taken all the precautions possible, the outcome was not in his hands and he could not be held accountable.

Criminal trial. Forceps found in abdominal cavity at autopsy.—A patient with a large fibroid was operated on by Lassallette(64). Death occurred a few hours after the operation. Autopsy disclosed a forceps in the peritoneal cavity.

At the trial the operator was condemned to two months in prison, for homicide through negligence. The sentence was served.

After serving the sentence, Lassallette put in a plea that the patient's death had not been caused by the retention of the instrument, but by nux vomica. The death occurred too soon to have been due to the presence of the instrument. It was proven that a midwife of bad reputation had a bottle of nux vomica in her hand at the house on the day of the death. This was an entirely new phase. The body was exhumed. Lassallette was acquitted.

Lawsuit. Small gauze sponge removed by secondary operation.—The patient was operated on for appendicitis at the Toledo Hospital, November 1, 1897, by Gillette(46). After the abdomen was open it was found that the trouble was tubal pregnancy. The appendix incision was closed and a median incision made and through that the operation was completed. About four days after the operation, the appendix incision began to discharge pus. Gillette treated this sinus persistently under the impression that it was kept up by unabsorbed kangaroo tendon, which might at any time be wholly absorbed and thus permit healing. After twelve months of this treatment, the patient went to another physician who, eighteen months after first operation, did a secondary operation and found a small gauze sponge, after which the patient recovered. Suit was entered for $5000.

In the trial court, the verdict was for the defendant, on the round that the cause of action, if any arose, was barred by the tatute of limitation. The Circuit Court held that the trial

court was in error and reversed the decision. Supreme Court was divided equally on the subject, hence the decision of the Circuit Court was allowed to stand—verdict for the plaintiff.

Criminal trial. Two artery forceps found in abdomen at secondary operation.—The patient was operated on for ovarian cyst, Dec. 22, 1897, by Prof. Kosinski (23) and Dr. Solman, in the latter's private hospital. After a few days there appeared fever and a mass, which continued. In the meantime two artery forceps had been missed, and it was thought they might be in the abdomen. The disturbance persisted and, six weeks after the operation, the abdomen was reopened and the mass of exudate investigated, but neither forceps nor pus was found. The patient was better afterward and went home, but did not get well. Later a hard mass developed near the umbilicus. Kosinski still thought the forceps might be in the abdomen and insisted on another operation and offered to perform it gratis. But the sons would not hear to this, and the patient was taken to several other physicians, one after another, hoping to be cured without operation. Finally, six months after the primary operation, the symptoms became acute and threatening and the physician who was called in, insisted that the patient be taken to Kosinski at once that he might perform the operation which had then become imperative. This the family refused to do and called in another physician, who operated. On opening into the mass at the pelvic brim, he found a cavity in which lay the two artery forceps. Both forceps had forced an entrance into the external iliac artery. The removal of the forceps was attended with a furious hemorrhage, from which the patient died on the table.

Legal action was entered against Kosinski and there was an extensive trial, with an imposing array of legal and medical talent. Six experts were appointed to testify in the case—Przewoski and Troichij to consider the pathologico-anatomical features, Krajewski to describe a modern laparotomy, Maksimow to criticise the operation as performed in this case, Pawlow to consider the various complications and mistakes that may occur in a laparotomy, and Neugebauer to supply the statistics which might be required in the trial. It was for use in this trial that Neugebauer compiled the list of cases that he published the following year (1900), which publication has done so much to enlighten the profession on this subject.

The trial resulted in the acquittal of the accused as far as causing the death of the patient was concerned—it having been shown

that he strongly insisted on a line of treatment which would probably have prevented the patient's death, had the treatment not been peremptorily rejected by the family.

A curious clinical feature of this case was that, during the patient's illness, a number of radiographs of the suspicious area were made, but not one of them showed the forceps—the failure being due doubtless to defective technic.

Lawsuit. Sponge left in abdomen.—Baldwin(37) was made defendant in a suit, and a question that assumed much importance in the case was as to whether the responsibility for the count of the sponges lay with the surgeon or with the nurse.

The suit against the surgeon was finally withdrawn, and legal action was begun against the hospital where the operation occurred.

Lawsuit. Gauze compress left in abdominal cavity.—Patient was operated on for pyosalpinx by Everke(35). The disease was chronic and severe and the operation was long and difficult. A gauze compress was left in the abdominal cavity. Later this was recovered without any lasting injury to the patient. She was relieved of the suffering which she had endured for years before the operation and her health was completely restored. But from mercenary motives, suit was instituted against Everke. Later the suit was withdrawn.

Lawsuit. Sponge left in the cavity.—"Prof. Krasowski was legally proceeded against for having left a sponge in the abdominal cavity. The suit resulted in an acquittal."(23)

Lawsuit. Sponge left in the abdominal cavity.—In a personal communication to Neugebauer, Prof. Ahfeld(43) reported that he had been made defendant in suit on account of leaving a sponge in the abdomen. Termination of case not given.

Lawsuit. Artery forceps extracted from a sinus. The patient was subjected to operation for a sarcomatous growth in the abdominal wall, by Dollinger.(53) The patient was three months pregnant at the time of the operation. She recovered from the operation and was delivered at term without any special disturbance. She became pregnant again. Her health was excellent and she was able to do all her housework. In the latter part of the pregnancy there appeared in the operative scar a swelling, which opened and discharged much offensive pus. The abscess was still further opened by the family physician. Within a few days she was delivered. A few days after the delivery, an artery forceps was discovered in the abscess wall. The patient

was sent to the hospital and the forceps removed by operation. The patient died two days later.

The husband of the patient demanded money of Dollinger, which demand was refused. He then went to the public prosecutor and endeavored to have a criminal prosecution brought against the surgeon. The prosecutor asked Dollinger for a written statement of the case, which was given. The prosecutor saw no evidence to warrant criminal proceedings, and dropped the matter.

The husband then brought civil suit and for thirteen months Dollinger spent all his time defending himself. Sensational reports appeared in the public press and it is said that the comic papers made capital of it and pamphlets on the subject were sold at the cigar stands. Though acquitted, Dollinger suffered irreparable damage from the sensational newspaper reports and the consequent notoriety. He urges strongly that some means should be provided by which reputable physicians may protect themselves from this species of blackmail and newspaper persecution.

Criminal trial. Piece of an instrument left in abdomen.—A Paris surgeon lost part of a broken instrument in the abdominal cavity. The patient died. The surgeon was put on trial for manslaughter due to negligence. Result of trial not stated.

Lawsuit. Pair of spectacles found in abdominal cavity.—The patient had three operations—the first in America, the second in Germany and the third in France. The French surgeon found a pair of spectacles in the abdomen. The patient sought redress in the courts.

The outcome of the trial is not given, neither is it stated definitely who was sued. Neugebauer, who cites the case, blames the German surgeon—noting that he either left the spectacles himself or missed finding them if left by the previous operator.

Lawsuit. Sponge removed at secondary operation.—The patient was operated on for an abdominal tumor by Thorne(53). Several months later a secondary operation was performed by another surgeon and a sponge was found in the abdominal cavity. The patient recovered. Legal proceedings were begun against the first operator (Miss May Thorne), on the ground that she was guilty of negligence in not personally counting the sponges used in the course of the operation, before the wound was closed.

The defendant denied negligence and held that the leaving of a sponge was an accident that could not always be avoided. She

further said that, like a large number of other operating surgeons, she left the counting of the sponges to a responsible nurse—considering that it was the duty of the surgeon to keep his or her eyes continually upon the patient until the wound had been closed.

The judge, in summing up the case, said there was no doubt that the defendant was a skilful surgeon, but the question in this case was not as to her skill, but whether she had been guilty of want of reasonable care. The points for the jury were: (1) whether the defendant was guilty of want of reasonable care in counting or superintending the counting of the sponges; (2) whether the nurse was employed by the defendant and under her control during the operation; (3) whether the nurse was guilty of negligence in counting the sponges; and (4) whether the counting of the sponges was a vital part of the operation which the defendant undertook to see properly performed.

After lengthy consideration, the jury returned a verdict for the plaintiff.

Criminal trial. Sponge found at autopsy.—The patient was subjected to exploratory laparotomy by d'Antona.(53) A carcinoma of the liver was found, and an unfavorable prognosis given. The patient recovered from the immediate effects of the operation, but died after a month. At the autopsy, a gauze pad, 70 by 40 cm. was found and also two liters of pus. The physicians who made the postmortem examination gave out a statement to the effect that the death was due to the presence of the sponge and the peritonitis and secondary pleuritis resulting therefrom. The public prosecutor then had d'Antona indicted and placed on trial for criminal negligence.

The verdict was that the patient would have died from the other causes present. The prosecutor then claimed that the hospital records had been falsified, hence a new trial was granted. In the second trial ten experts were called and they all testified that there was sufficient cause for death outside of any influence which the sponge within the abdomen might have had. The trial was then discontinued, because of the absence of prosecuting evidence.

This case was reported by Prof. Pio Foa, who stated that if the autopsy had been conducted by competent pathologists, such an erroneous report would not have been made, and the unfortunate trials would not have occurred.

Lawsuit. Sponge left in abdomen.—The patient was subjected to abdominal section by Schooler.(56) Later developments

indicated that a sponge, sixteen inches square, had been left in the abdomen. Suit was entered for $1500. Verdict for the plaintiff.

Lawsuit. Sponge left in abdomen.—The husband of the plaintiff was operated on for appendicitis by Hageboeck.(56) It was charged that a surgeon's sponge had been left in the abdomen and that this caused an abscess which resulted in death. Suit was entered for $50,000.

In two trials, the jury disagreed. It was reported that in each trial the jurors stood 11 to 1 in favor of the plaintiff. The case was to come up for a third trial the latter part of the year (1908).

Lawsuit threatened. Gauze strip discharged per vaginam.—The patient was subjected to vaginal section, for pelvic suppuration, by MacLaren.(51) It was a very severe case. There was persistent bleeding requiring packing, and there were two secondary hemorrhages requiring repeated packing. The patient recovered. Two months afterward a very offensive discharge appeared and the patient extracted a twelve-inch strip of iodoform gauze from the vagina.

Suit was threatened and, on the advice of his attorney, MacLaren paid the patient a considerable sum to avoid further proceedings.

Lawsuit threatened. Gauze compress discharged per rectum.—The patient had uterine fibroids which Borysowicz(23) removed by abdominal operation. Three weeks later, a gauze compress was passed per rectum. Evidently the compress had been left in the peritoneal cavity at the time of the operation. The patient recovered and thanked the operator most gratefully for his services and left him her photograph. Six years later he received a number of letters from the patient's husband, threatening prosecution for malpractice if he did not at once pay a certain sum. The husband had no doubt heard of a lawsuit (Kosinski's?) then on at Warsaw, and thought it an easy way to obtain some money from Borysowicz. Apparently nothing came of the effort.

Lawsuit threatened. Forceps alleged to have been passed per rectum.—The patient was operated on for a suppurating ovarian cyst by Tuholske.(14) It was an extremely severe case, but the patient recovered and regained her health rapidly. Twenty months later she wrote that she had given birth to a fine baby and felt well. Labor had been uncomplicated. The account continues: "Some five or six months after that (more than two years after the operation) the husband called on me and stated that for two or three months his wife had had some rectal trouble,

supposed to be piles, and that a week ago, under considerable suffering, she had passed a forceps at stool. He brought it to me; it was a forceps such as is usually carried as dressing forceps in a pocket-case, not hemostat. I did not claim ownership. At any rate, if that forcep had been in the pelvis for two and a half years, during pregnancy and labor, without giving rise to a symptom or modifying labor, it was a remarkable occurrence. Three months after this episode the patient was reported well." In a later reference to the case, Tuholske stated that several demands were made for money, accompanied by threats of a suit. No attention was paid to the demands and finally they ceased. He expressed the opinion that it was an attempt to obtain money by blackmail.

The Question of Deception, Intentional or Otherwise.—The repeated occurrence of this accident in the past and the possibility of its occurrence at any time gives an opportunity for designing persons to obtain money under false pretenses. Neugebauer calls attention to this fact, and remarks that, following the newspaper publicity given the Kosinski trial, a number of damage suits, alleging the accident, were filed, and that in most instances they were cases of blackmail or extortion.

A case has been reported of a patient who, following convalescence from an abdominal operation, expelled pieces of gauze or other cloth from the mouth. The patient claimed that the expelled pieces were vomited sponges which had worked their way into the stomach from the peritoneal cavity. Suit was threatened. The matter was dropped, however, when the practical impossibility of the occurrence, as detailed, was explained to the patient.

When discussing the subject of foreign bodies left in the abdominal cavity, a physician related to me some of the details of a case in which he had been involved. He performed an abdominal operation and, some time following the convalescence, the patient came to him and exhibited a surgical needle and stated that the needle had been passed per rectum. The patient's statement was confirmed by a physician who claimed to have treated him at the time the needle was passed. Suit was threatened. On examination of the needle, the operator found it was not the kind he used at the operation, and he became convinced that the alleged occurrence was an attempt at blackmail.

The matter dragged along for some time. The operator accumulated all the information he could concerning the subject and concerning the parties involved, and finally confronted them

in such a way that they were forced to make a written statement acknowledging that the needle had not been passed per rectum, as alleged. The needle exhibited had been obtained elsewhere for the purpose of threatening suit and extorting money.

Porter(74) gives an account of a peculiar case bearing on this subject. The operation was for a parovarian cyst and hydrosalpinx and chronic appendicitis. The convalescence was normal and the patient left the hospital twenty-two days after the operation, feeling well. Eight days later, Porter received a telephone message from the patient's family physician, stating that he had removed several pieces of gauze from her vagina.

Quoting from the report, "On inquiry from him, I learned that the pieces did not tear off, but came away, or rather were removed with forceps, in the shape of rolls about the length and size of a lead-pencil, and after all presenting were removed others would present in a few hours, requiring that he visit her two or three times a day to take them away. The doctor thought that the pieces came from the pelvic cavity through an opening in the right side of the vagina about the size of a lead-pencil.

"On the next day but one after learning of the matter, I visited the patient at her home with her doctor, and found the patient on a cot apparently suffering some pain, which she said was due to more pieces 'coming down.' She did not look sick. In reply to my question she said she felt well until she got a jolt on the car on her way home and that since then she had been having pain, which was worse at times, and had not been so severe since the pieces began to come away. The first knowledge the doctor had of the nature of the trouble came through the patient's husband, who told him that there was a piece of gauze protruding from the vagina. I asked to see what had been removed and was shown a large number of pieces of different texture, whereupon I remarked that the goods were not such as I had used as sponges, that there were more pieces than had been used all told in the operation, and that consequently they had not been left in the woman's belly by me. It was averred that they could get into her belly only through the wound made by me and at the time it was made, because it had been closed, healed by first intention, and was still closed. The patient facetiously remarked that she 'supposed she swallowed 'em.' 'No,' I replied, 'had you swallowed them they would not come out through the vagina.'

"Dr. F. now asked the patient if she thought more 'pieces were

down,' being answered in the affirmative, he introduced a speculum and found that she was right. I removed the speculum and introducing my finger came upon a small wad of something which upon removal proved to be a piece of ordinary white muslin about three inches wide by seven inches long, twisted into a rope, doubled upon itself so as to make a small ball or wad. It was perfectly clean and was so saturated with what looked and smelled like urine that on squeezing between the fingers several drops were squeezed out. I examined the vagina with my finger, assuring myself that there were no more 'pieces' there, that there was no hole leading into the pelvic cavity and that, in fact, it was a perfectly healthy vagina and in nowise unusual except its cleanliness, for which, of course, the frequent wipings it received were accountable.

"In the presence of the patient, her mother-in-law and the doctor, I said, pointing my finger at the patient, 'Doctor, I don't know where those rags came from, but that woman knows —— well, and could tell if she would.' The mother-in-law objected to my statement rather forcibly, but the patient said nothing. I then took the doctor outside, told him that the woman was a malingerer and that we would give her a chance to put some more rags in for removal. We received one more piece before we left. Before leaving I insisted upon both the doctor and myself making a thorough inspection of the vagina with the eye and the finger as well. This was done, but no abnormality was found. It should be stated that some of the 'pieces' were tinged with blood, but none of those removed during my visit were so tinged."

Dr. Porter exhibited ten pieces of different size, shape and texture, then continued: "Eight days after my visit, Dr. Fisher reported 'no more exhibits.' So far as I know, no threat was made of a suit for damages nor did the patient or her mother seem out of humor with me. The husband was at work and not present during my visit, although he presumably knew the day before that I was to be there, as I had sent word that I was coming."

In regard to the possible cause for the deception, Dr. Porter mentioned: 1. desire for money, 2. desire for sympathy, 3. desire to avoid work, 4. sexual perversity. He stated that during the patient's stay in the hospital nothing pointing to a neurotic condition was noted. Indeed, she was regarded as an unusually nice and agreeable patient.

Schaefer(43) gives the details of a case which emphasizes the fact that when a piece of gauze is found in the abdominal cavity

it does not necessarily follow that it was left there in a previous operation. The case occurred in the practice of Pryce Jones. Jones was called to see a woman with an abdominal swelling. This proved to be an abscess, which was opened and discharged a piece of cloth.

There had been no previous operation. The woman was insane and had been in the habit of tearing up pieces of cloth and swallowing them. The swallowed cloth had evidently caused ulceration of the stomach wall with subsequent perforation into the peritoneal cavity.

The noted intestinal "hair-balls," requiring operation, constitute another class of foreign bodies in the abdomen which were not left there by the surgeon.

Again, the professional "knife swallowers" and "glass eaters" and their amateur imitators must be kept in mind. Fortunately, the menu of these persons is limited, as a rule, to household articles. However, some such "actor," who has been relieved of his accumulated load by surgical art, might, from the intimate acquaintance, acquire a taste for surgical forceps instead of the usual nails and pocket-knives. In that case a condition might easily develop that would make it very uncomfortable for the previous operator, though wholly without fault on his part.

PREVENTIVE METHODS.

Counting the Sponges.—Simple counting of the sponges before and after operation, combined with "watching what goes into and what comes out of the cavity," was probably the earliest method employed to prevent the leaving of a sponge in the abdomen. But in the course of time it was found that the counting did not give the expected security, and special measures were employed to increase the accuracy of the count, such as separate counting by two individuals (double counting), putting numbers on the sponges or having racks for their reception.

As early as 1884, "double counting" was in use in the London hospitals. The continued occurrence of the accident caused surgeons to seek further means for preventing a mistake in the counting. Very small sponges were discarded, except for use in sponge-holders, and the larger sponges were limited in number so as to lessen the chance of mistake. Only a specified number of sponges were prepared for operation and these were put up in bundles, each containing a certain number. The counting before

and after was to be in the hands of only thoroughly responsible assistants or nurses.

As the accident still continued to occur, various additional expedients were devised for increasing the accuracy of the accounting. One European surgeon of note used a special stand with separate compartments, each compartment to contain a certain number of sponges. On the other side of the operating table was a similar stand with compartments to receive the soiled sponges. Still another surgeon had hooks on the wall—"a hook for every sponge"—and at the close of the operation there had to be "a sponge for every hook." In this country Kelly(31) devised, some years ago, a special rack to receive the soiled sponges and increase the accuracy of counting. Kreutzmann(53) marked each of his compresses with indelible ink, and each bundle of twelve was marked differently—for example in one bundle the compresses would be marked 1, 2, 3, 4, etc., in another bundle I, II, III, etc., in another bundle a, b, c, d, etc., and in still another bundle, A, B, C, etc. Thus no two sponges were marked alike. At the close of the operation the sponges were spread out on the floor and the operator could glance at them and assure himself that they were all there.

In addition to these special expedients, there was always enjoined careful general watchfulness on the part of the surgeon and also close attention to "what goes into and what comes out of the cavity." In order to increase the efficiency of this watchfulness, it was suggested that the surgeon think aloud, so to speak, so that the sponges put in and taken out might be noted or checked. Neugebauer mentions particularly the precaution to state definitely, as each sponge was drawn out of the abdomen, "One sponge returned from cavity" or "Two sponges returned from cavity," and the fact to be recorded by an assistant or nurse who responds, "Noted."

In all the methods above mentioned the sponges are allowed to go free in the cavity, and their recovery depends for the certainty of its completeness upon the accuracy of the accounting.

Attaching a Tape to Each Sponge.—The danger of the dependence on counting having been impressed by disastrous experiences, it was hoped to find security by attaching a tape to each sponge, the end of the tape to remain outside. This method has many variations. The tapes vary in length from nine inches to six feet and more ("two meters," "several meters"). Some sur-

geons leave the outer end of the tape free, others fasten it to the laparotomy sheet with a forceps, and still others attach to it a heavy object which is to remain outside the operative field. A forceps is the object most commonly attached to the tape. A number of surgeons use the colored glass beads or small balls recommended by Mikulicz. Bircher, and also Russell, attach a lead seal to the end of each tape. Carson has for several years used harness rings for this purpose. Fowler designed a system of duplicate checks. In the preparation of the sponges, two checks are attached to each tape. When the pad is passed to the operator one check is removed and placed in the basin from which the pad was taken. At the close of the operation the checks must balance each other.

Wachsberg devised a large metal box, the bottom of which was perforated with a hole for each tape. The end of each tape was passed through its appointed hole and securely knotted on the other side, so that there was no possibility of its getting away. The desperation engendered by experience with this accident and failure of ordinary methods of prevention is shown by the practice of Calman, who had a long tape attached to each sponge and whenever a sponge was passed into the abdomen, someone caught the other end of the tape and tied it around the leg of the table. But even this is not so absolutely safe as might at first appear. To be sure, there is no probability of the table being drawn into the abdomen and lost, but there is the possibility of the tape tearing off the sponge, which accident has happened more than once with tapes attached to sponges.

The method of attaching tapes to sponges and artery forceps to the tapes, in combination with the counting of sponges, has long been on trial. In 1897 Tuholske(14) mentions its routine use by himself, and records a case in which in spite of it, a sponge escaped him. This is the method probably in most general use to-day. It has a record of many failures.

Fisher(75) attaches all the sponges used to one tape. The tape is three to four feet long and armed with a dull needle. As each pad is put into the abdomen, one end is threaded on the tape, and thus they are all fastened together. Wedershake(77) adopted a method of keeping four to eight sponges fastened together. A large piece of gauze was cut at four to eight places, the cuts extending from the margin toward the center, but not quite to the center. Thus all the sponges made from that piece were fastened together by the uncut part at the center.

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.

Abdominal Section. Sponges Left.

No	Date of Report	Operator*	Character of Operation	Article Lost	When and How Removed	Result
1	1859	Fehr. (1)	?	Sea sponge.	Details not given. Mentioned by Fehr and quoted by Olshausen. *c.*	?
2	1877	? (2)	?	Sea sponge.	Found at secondary operation by G. Braun. *c.*	?
3	1883	Lawson Tait. (3)	?	Sponge.	Sponge missed. Four hours later wound was reopened and sponge recovered. *a.*	?
4	1884	H. P. Wilson. (4)	Ovarian cyst and pregnancy.	Pieces of sea sponge.	Five months after operation, pieces passed through sinus in scar. *a.*	Recovery
5	1884	T. G. Thomas. (4)	Carcinoma of spleen.	Pieces of sea sponge.	Found at autopsy. Patient died four days after operation. Carcinoma inoperable. *a.*	Death.
6	1884	Howitz (4).	Uterine necrosis.	Sponge	Found at autopsy. Details not given. Cited by Wilson. *a.*	Death.
7	1884	"London surgeon." (4)	?	Sponge.	Found at autopsy.† Cited by W. T. Howard and also by Wilson. *a.*	Death.
8	1889	Bridden. (5)	Myomectomy.	Sea sponge, 7 cm. wide.	Found at autopsy. Patient died sixth day of peritonitis. *c.*	Death.
9	1892	Pilate. (6)	Hysterectomy.	Compress. 8 inches long.	Passed per rectum, nine months after operation. *a.*	Recovery
10	1892	Salin. (7)	Ovarian tumor.	Gauze napkin.	One year later, gauze removed through an abscess sinus, with subsequent fecal fistula which healed. *a.*	Recovery
11	1892	"French surgeon." (8)	Salpingitis.	Two strips of gauze.	Eight months later, 35 cm. strip of gauze extracted per vaginam, still later intestine resected and 10 cm. strip found within. *a.*	Recovery
12	1892	"French surgeon." (8)	Uterine fibroid.	Compress. 26 cm. long.	Eight months later passed per rectum, without alarming symptoms at any time. *a.*	Recovery
13	1892	"French surgeon." (8)	Myomectomy.	Sponge.	A few hours after operation abdomen was reopened and sponge located and removed. *a.*	Recovery
14	1892	Quinn. (6)	Pyosalpinx.	Napkin.	Found at autopsy. Was suspected. Death on third day with symptoms of severe dysentery. *a.*	Death.

15	1893	Terrier. (9)	?	Sponge.	Found at autopsy. Death on third day from peritonitis. *a.*	Death.
16	1893	? (10)	Hysterectomy.	Compress.	Secondary operation by Michaux for painful abdominal mass. Compress found within intestine. *a.*	Death.
17	1895	Elsner. (11)	Fibroid and ovarian cyst	Pad, 7x8 inches.	Six months later, passed per rectum. Progress of mass noted along course of colon in last month. *a.*	Recovery
18	1896	MacLaren. (12)	Ovarian cyst and retroversion.	Gauze sponge 6x6 inches	Ten days after operation, expelled from rectum. Secondary operation three months later for adhesions. *a.*	Recovery
19	1896	? (12)	?	Sea sponge.	Details not given. Two cases were observed by MacLaren at autopsy in New York Woman's Hospital.	Death.
20	1896	?(12)	?	Sea sponge.	See preceding note.	Death.
21	1896	Severeano. (13)	Ovarian sarcoma.	Two compresses, each 130x30 cm.	After some months, one compress was extracted from a persistent sinus, and three weeks later, the other. *a.*	Recovery
22	1897	Tuholske. (14)	?	Sponge.	One hour after operation, sponge missed. Abdomen reopened and sponge found and removed.	Recovery
23	1897	? (15)	?	Sponge.	Details not given. H. C. Coe states that in autopsy work he found a sponge in five cases. Death by sepsis in each. *a.*	Death.
24	1897	? (15)	?	Sponge.	See preceding note. *d.*	Death.
25	1897	? (15)	?	Sponge.	See preceding note. *a.*	Death.
26	1897	? (15)	?	Sponge.	See preceding note. *a.*	Death.
27	1897	? (15)	?	Sponge.	See preceding note. *a.*	Death.
28	1897	? (16)	?	Sponge.	Twelve years later, passed per rectum. Reported by Hefting. *a.*	Recovery
29	1897	Linquist. (17)	Tubal pregnancy.	Gauze compress.	Two months later, passed per rectum. *a.*	?
30	1897	McMurtry. (14)	Ovarian cyst.	Flat sponge.	Sponge missed before patient recovered from anesthetic. Sutures clipped and sponge removed.	Recovery
31	1897	R. B. Hall. (14)	Appendicitis.	Sponge.	Four hours later, sponge missed. Abdomen reopened and sponge removed.	Recovery
32	1898	Wiggin. (18)	Secondary operation for silk ligature.	Gauze strip.	Some weeks after operation, gauze strip was removed from a persistent sinus. Lawsuit. *c.*	Recovery

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.—CONTINUED.

ABDOMINAL SECTION. SPONGES LEFT.

No.	Date of Report	Operator*	Character of Operation	Article Lost	When and How Removed	Result
33	1898	Schramm. (19)	Hysterectomy.	Compress.	Four weeks later, operated for a mass, which proved to be the compress. *a.*	Recovery
34	1898	Leopold. (19)	?	Compress.	Removed by secondary operation. Was near liver. *a.*	Recovery
35	1898	? (20)	Cesarean section.	Compress.	Found at autopsy by Olshausen. Caused fatal peritonitis. *a.*	Death.
36	1898	Brosin. (19)	Bicornuate uterus.	Compress, 20 cm. long.	Six months later, expelled from a persistent sinus. *a.*	Recovery
37	1898	Roesger. (21)	Uterine fibroid	Fragments of sea sponge.	After six months, particles discharged through a persistent sinus. *a.*	Recovery
38	1898	Bolt. (22)	Hysterectomy for fibroid	Gauze sponge.	Several months later, secondary operation. Sponge found in intestine. Resection. Death from shock. *a.*	Death.
39	1898	Schroeder. (23)	Oophorectomy.	Gauze sponge.	Secondary operation some months later for an abdominal mass. Sponge in mass. *a.*	?
40	1898	? (19)	?	Sponge.	Found at autopsy by Thiersch. *a.*	Death.
41	1898	? (22)	?	Sponge.	Boldt stated in 1898 that he knew of five unpublished cases (among colleagues) of foreign bodies left in abdomen. *a.*	?
42	1898	? (22)	?	Sponge.	See preceding note of five cases (count three sponges, and two forceps). *a.*	?
43	1898	? (22)	?	Sponge.	See preceding note. *a.*	?
44	1898	? (22)	?	Sponge.	Boldt states that pathologist in New York Hospital found foreign body at autopsy in two cases (1 sponge, 1 forceps). *a.*	Death.
45	1898	? (22)	?	Sponge.	Boldt cites two cases in which abdomen was immediately opened, and forgotten article removed (1 sponge, 1 forceps). *a.*	?
46	1898	Eckstein. (24)	Ovarian cyst, twisted pedicle.	Sponge 20x40 cm.	First weeks later extracted from sinus in scar. Count of sponges after operation, stated "correct." *d.*	Recovery

47	1899	Buschbeck. (25)	Tubal pregnancy.	Large compress.	Two and one-half years later removed from sinus in scar. *a.*	Recovery
48	1899	Meinert. (25)	?	Mull compress.	Three weeks later, secondary operation for mass in right lower abdomen. Proved to be compress. *a.*	Recovery
49	1899	Rehn. (26)	Pyosalpinx.	Compress, 1 m. square.	Four months later secondary operation. Compress found within intestine. Resection of 40 cm. *a.*	Recovery
50	1899	Kader. (27)	Salpingitis.	Compress, size of handkerchief.	Sinus present for six months. Later the compress passed per rectum. Death from peritonitis. *c.*	Death.
51	1899	Busch. (28)	Uterine fibroid.	Mull compress.	Two months later, passed per rectum, after much trouble. *c.*	Recovery
52	1899	Fritsch. (29)	?	Sponge.	One year later removed by secondary operation. Cited by Kayser. *c.*	Recovery
53	1899	Fritsch. (29)	?	Sponge.	No details given. Cited by Kayser. *c.*	?
54	1899	Fritsch. (29)	?	Sponge.	Two years later removed by secondary operation. Cited by Kayser. *c.*	Recovery
55	1899	Gillette. (46)	Tubal pregnancy.	Sponge.	Eighteen months later, removed by secondary operation. Lawsuit.	Recovery
56	1900	Merttens. (30)	Pelvic suppuration.	Compress.	Five months later, operation for abdominal mass. Compress within intestine. Resection of intestine. *a.*	Recovery
57	1900	Wunderlich. (30)	Ovarian cyst.	Compress, 21x100 cm.	Three months later, compress was passed per rectum. *c.*	Recovery
58	1900	Wunderlich. (30)	Cystectomy.	Linen cloth.	Found at autopsy. Death on third day. No evidence of peritonitis. *d.*	Death.
59	1900	H. A. Kelly. (31)	Pelvic suppuration.	Marine sponge.	Some days later, wound was reopened because of disturbance. Sponge found and removed. *c.*	Recovery
60	1900	Kelly. (31)	Ovarian cyst.	Large gauze pad.	Two and a half months later, operation for abdominal mass. Mass contained sponge and abscess. *c.*	Recovery
61	1900	Kelly. (31)	Ovarian cyst and appendicitis.	Gauze pad.	Five days later, operation for fever and a mass. In mass was sponge and abscess. *c.*	Death.
62	1900	Assistant to Kelly. (31)	Fibroid of abdominal wall.	Gauze, 360 gm. weight.	One month later, secondary operation for mass in abdomen. Contained sponge and abscess. *c.*	Recovery
63	1900	? (23)	?	Sponge.	Reeves Jackson described two cases in which a sponge was found at autopsy. *a.*	Death.

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.—CONTINUED.

ABDOMINAL SECTION. SPONGES LEFT.

No.	Date of Report	Operator*	Character of Operation	Article Lost	When and How Removed	Result
64	1900	? (23)	?	Sponge.	See preceding not *a*.	Death.
65	1900	Spencer Wells. (23)	?	Sponge.	Sponge missed. Abdomen reopened next day and sponge found. *a*.	Recovery
66	1900	Winkle. (23)	Myomectomy.	Sponge.	Found at autopsy. Details not given. *a*.	Death.
67	1900	? (23)	Wound of omentum.	Sponge.	Two weeks later, songe was extracted from an a bdominal sinus. *a*.	?
68	1900	? (23)	?	Gauze napkin.	Found at autopsy by Kijweski. Details not given. *a*.	Death.
69	1900	? (23)	?	Gauze.	Przewoski found gauze in cavity at three autopsies following abdominal section. *a*.	Death.
70	1900	? (23)	?	Gauze.	See preceding note. *a*.	Death.
71	1900	? (23)	?	Gauze.	See preceding not *a*.	Death.
72	1900	Krasowski. (23)	?	Sponge.	Prof. Krasowski was legally proceeded against for leaving a sponge in the abdomen. *a*.	?
73	1900	Frankenhauser. (23)	Myomectomy.	Sponge.	Removed by secondary operation. Details not stated. *a*.	Recovery
74	1900	Bier. (32)	Tubal pregnancy.	Mull compress, 1x1½ m.	Six months later, secondary operation. Compress found within intestine. *c*.	Recovery
75	1900	Bier. (32)	Pelvic tuberculosis.	Gauze strip.	Long time afterward, gauze passed per rectum. *c*.	Recovery
76	1900	?	Two laparotomies, pyosalpinx	Iodoform gauze, 52x44 cm.	Secondary operation for intestinal obstruction by Chaput. Gauze found within intestine. Intestine incised. *c*.	Recovery
77	1900	Atlee. (23)	Ovariotomy.	Sponge.	Found at autopsy. At operation a sponge was torn in two by an assistant. *a*	Death.
78	1900	Borysowicz. (23)	Uterine fibroid.	Gauze sponge.	Three weeks later, sponge was passed per rectum. Lawsuit threatened. *a*.	?

79	1900	Karl Braun. (23)	?	Sponge.	Found at autopsy. *a.*	Death.
80	1900	? (23)	?	Sponge.	Found at autopsy. Reported by W. T. Bull. *a.*	Death.
81	1900	? (23)	?	Gauze napkin.	Found in a secondary labarotomy by Dmochosky. *a.*	?
82	1900	George J. Englemann. (23)	Ovarian cyst.	Small sponge.	Sponge missed at operation. Searched for carefully but not found. Found at autopsy four days later. *a.*	Death.
83	1901	Beck.(34)	Fibroid and pyosalpinx.	Sponge.	One month later, sponge was extracted from an abscess in scar.	Recovery
84	1901	? (34)	?	Sponge.	Sponge finally passed per rectum. Cited by Beck, who was called to see patient by Leusman.	?
85	1901	Everke. (35)	Pyosalpinx.	Gauze compress.	Later recovered by secondary operation. Details not given. Lawsuit. *c.*	Recovery
86	1901	Everke. (35)	Cesarean section.	Napkin.	Found at autopsy. Death on fifth day from splanchnic irritation. No sepsis. *c.*	Death.
87	1901	Le Conte. (36)	Tubercular peritonitis.	Gauze strip, 1 yd. wide and 5 ft. long.	Year later, strip removed from a persistent fecal fistula. Suggestion made that accident was beneficial to patient. *b. c.*	Recovery
88	1901	M. D. Mann. (37)	?	Flat sponge.	Removed next day. No harm resulted. *b. c.*	Recovery
89	1901	? (37)	?	Gauze pad.	Cited by M. D. Mann. *b. c.*	Death.
90	1901	? (37)	?	Gauze pad.	Cited by M. D. Mann in his letter to Schachner. *b. c.*	Death.
91	1901	? (37)	?	Gauze pad.	Some months later, pad was discharged through sinus in scar. Cited by M. D. Mann. *b. c.*	Recovery
92	1901	H. C. Coe. (37)	?	Large gauze pad.	Four weeks later, pad was felt under scar, and removed. *b.c.*	Recovery
93	1901	Coe. (37)	?	Gauze sponge.	Particulars not given. *b. c.*	Recovery
94	1901	Coe. (37)	?	Gauze pad.	Particulars not given. *b. c.*	Recovery
95	1901	Roberts. (37)	Hysterectomy.	Sponge.	One week later, sponge was extracted from an abscess in the wound. *b. c.*	Recovery
96	1901	Roberts. (37)	Pelvic inflammation.	Pad.	Found at autopsy, by Irwin Abell. Death 78 hours after operation, with symptoms of ileus. *b. c.*	Death.
97	1901	F. W. Samuel. (37)	Fibroid and pyosalpinx.	Flat sponge.	Found at autopsy. Death the third day. with symptoms of nephritis. *b. c.*	Death.

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.—CONTINUED.

ABDOMINAL SECTION. SPONGES LEFT.

No.	Date of Report	Operator*	Character of Operation	Article Lost	When and How Removed	Result
98	1901	H. Grant. (37)	Gunshot wound of abdomen.	Two sponges.	Found at autopsy. Patient died a few hours after operation. *b. c.*	Death.
99	1901	T. S. Bullock. (37)	Ventral hernia.	Gauze pad, 7x5 inches.	Eight days later, pad was extracted from a sinus in the wound. *b. c.*	Recovery
100	1901	? (37)	Appendicitis.	Gauze pad.	Three weeks later pad appeared at drainage wound and was extracted. *b. c.*	Recovery
101	1901	Weir. (37)	Appendicitis.	Sponge.	Details not given. *b. c.*	Death.
102	1901	Weir. (37)	?	Gauze pad.	Removed in five days. Details not given. *b. c.*	Recovery
103	1901	Weir. (37)	?	Gauze pad.	Five months later, pad was removed. Details not given. *b.c*	Recovery
104	1901	? (37)	?	Sponge.	In his letter to Schnachner, Weir cites two cases in which he removed a sponge. *b.*	Death.
105	1901	? (37)	?	Sponge.	See preceding note. *b.*	Death.
106	1901	R. Matas. (37)	Appendicitis.	Iodoform-gauze strip.	Six months later, strip was extracted from a persistent sinus. *b. c.*	Recovery
107	1901	G. R. Fowler. (37)	?	Gauze pad.	In letter to Schnachner, Fowler mentions three cases. Details not given. *b. c.*	?
108	1901	Fowler. (37)	?	Gauze pad.	See preceding note. *b. c.*	?
109	1901	Fowler. (37)	?	Gauze pad.	See preceding note. *b. c.*	?
110	1901	Vander Veer. (37)	?	Sea sponge.	Patient died of peritonitis. *b. c.*	Death.
111	1901	Vander Veer. (37)	Carcinoma of uterus.	Sponge.	One year later, secondary operation for recurrence of carcinoma. Sponge found. *b. c.*	?
112	1901	C. P. Noble. (37)	?	Sea sponge.	Some weeks later, secondary operation and sponge found. *b. c.*	?

113	1901	? (37)	?	Two sponges.	Cited by J. B. Murphy. Details not given. *b. c.*	?
114	1901	? (37)	?	Piece of gauze.	Cited by J. B. Murphy. *b. c.*	?
115	1901	E. Lewis. (37)	?	Sponge.	Fourteen days later, sponge extracted from sinus in scar. *b.c*	Recovery
116	1901	A. MacLaren. (37)	Appendicitis.	Piece of gauze.	Three weeks later, gauze was extracted from drainage tract. *b. c.*	Recovery
117	1901	Gerster. (37)	Inoperable carcinoma.	Iodoform packing.	Found at autopsey Details not given. *b. c.*	Death.
118	1901	? (37)	?	Gauze pad and attached clamp.	Cited by Frank Hartley. Details not given. *b. c.*	?
119	1901	B. C. Hirst. (37)	?	Sponge.	Found at autopsy. Sponge torn in two by assistant. Sponges counted and reported "correct." *b. c.*	Death.
120	1901	? (37)	?	Gauze pad.	After some weeks, secondary operation for fecal fistula. A few days later, the sponge was passed per rectum. *b. c.*	?
121	1901	W. M. Polk. (37)	?	Half of a sponge.	Sponge torn in two at operation. Details not given. *b. c.*	?
122	1901	? (37)	Ectopic pregnancy.	Pad.	Later extracted from a persistent sinus in scar. Observed by A. J. Boyd. *b. c.*	Recovery
123	1901	W. T. Bull. (37)	Cholecystostomy.	Large flat sponge.	Five days later, discovered in drainage tract and removed. *b. c.*	Recovery
124	1901	Baldwin. (37)	?	Sponge.	Baldwin, of Columbus, Ohio, was made defendant in a law suit because of sponge left in abdomen. *b.*	?
125	1901	Munde. (37)	Sarcoma of kidney. Laparotomy.	Towel, 1x2 ft.	Four weeks later removed from a suppurating sinus. *b. c.*	Recovery
126	1901	Price. (37)	?	Sponge.	Sponge missed soon after c osing wound. Reopened and sponge removed. *b. c.*	Recovery
127	1901	Price. (37)	?	Sponge.	Similar to preceding case. Price cites two cases in his letter to Schnachner. *b. c.*	Recovery
128	1902	Russell. (38)	Oophorectomy.	Lint sponge.	Six months later, secondary operation. Sponge removed from within intestine. *c.*	Recovery
129	1902	Lindfors. (39)	Extrauterine pregnancy	Compress.	Later extracted from a pelvic abscess by vaginal incision. *c.*	Recovery
130	1903	Kayser, (40)	Postoperative hernia.	Gauze roll.	Two and a half months later, secondary operation. Gauze roll within intestine. Resection. *c.*	Recovery

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.—CONTINUED.

ABDOMINAL SECTION. SPONGES LEFT.

No.		Operator	Character of Operation	Article Lost	When and How Removed	Result
131	1903	Beckmann. (41)	?	Napkin.	Beckmann stated that he had three cases in which napkin was lost in abdominal cavity.	?
132	1903	Beckmann. (41)	?	Napkin.	See preceding note. No details given.	?
133	1903	Beckmann. (41)	?	Napkin.	See preceding note. No details given.	?
134	1903	Fick. (41)	Perityphlitis.	Cotton compress.	Secondary operation for fecal fistula. Sponge found within intestine. *c.*	Recovery
135	1903	Gruning. (41)	Uterine myoma.	Marley tampon.	Some weeks later, after pain in lower abdomen, tampon passed per rectum.	Recovery
136	1903	Schaefer. (42)	Myomectomy.	Gauze napkin.	Found at autopsy, two years later. Accompanied by intestinal necrosis. *c.*	Death.
137	1904	Ahfeld. (43)	?	Gauze sponge.	Prof. Ahfeld was subjected to a lawsuit in 1903, because of a sponge left in the abdomen. *c.*	?
138	1904	Corson. (44)	Ectopic pregnancy.	Sponge, 18x36 in.	Two and a half months later, sponge passed per rectum. *d.*	Recovery
139	1904	? (45)	Kidney operation. Laparotomy.	Sponge, 1 meter long.	Forty-six days later, secondary operation for painful mass and ileus. Sponge within intestine. Resection. *d.*	Recovery
140	1904	Reise. (45)	Extrauterine pregnancy	Sponge.	Ten months later, secondary operation for ovarian cyst and inflammation. Sponge found near sigmoid. *d.*	Recovery
141	1904	Thorne. (53)	Abdominal tumor	Sponge.	After several months, secondary operation. Sponge found. Lawsuit. *d.*	Recovery
142	1904	Winter. (47)	Hysterectomy for fibroid	Sponge.	Found at autopsy. Death three weeks after operation, of embolus. *d.*	Death.
143	1906	Waldo. (48)	Hysterectomy for fibroid	Towel.	Some weeks later, extracted through sinus in scar. Sponges counted and "correct." *d.*	Recovery
144	1906	? (48)	Salpingectomy.	Iodoform-gauze strip.	Two years later, found at secondary operation. Cited by Waldo. *d.*	?

145	1906	Ward. (48)	?	Sponge.	Later discharged per vaginam.	Recovery
146	1906	Brothers. (48)	Ectopic pregnancy	Pad.	Six weeks later, pad protruded from opening in lower part of scar.	?
147	1906	Grandin. (48)	?	Pad.	Two and a half years later, found encysted in the omentum.	Recovery
148	1906	Grandin. (48)	?	Towel, with hospital name on.	Three weeks later, secondary operation for mass under liver. Mass contained towel.	Recovery
149	1906	? (49)	?	Sponge.	One and a half years, later, operation by Amann for supposed fibroid. Proved to be a sponge. *d.*	Recovery
150	1906	Landau. (50)	Ovariotomy.	Napkin.	Eighteen weeks later, secondary operation for fecal fistula. Sponge found. *d.*	Recovery
151	1907	MacLaren. (51)	Hysterectomy.	Sponge, 12 in. square.	Found at autopsy, up under the liver. Death on the fourth day.	Death.
152	1907	Crossen. (52)	Pelvic suppuration.	Gauze pad.	Two weeks later, appeared in drainage tract and was extracted.	Recovery
153	1907	d'Antona. (53)	Carcinoma of liver.	Gauze napkin 40x70 cm.	Found at autopsy. Death in one month from carcinoma, peritonitis and adjacent pleuritis. Two lawsuits. *d.*	Death.
154	1907	Dobrucki. (53)	Ovarian cyst.	Sponge.	Three weeks later extracted through sinus in scar. *d.*	Recovery
155	1907	Janczewski. (53)	Ovarian cyst and pyosalpinx.	Gauze napkin.	Twenty-one days later removed from abscess in wound. (Janczewski, assistant to Neugebauer.) *d.*	Recovery
156	1907	Poten. (53)	Myomectomy.	Sponge.	Found at autopsy. Death after six weeks from bronchitis. No peritonitis. *d.*	Death.
157	1907	Prochownick. (53)	?	Sponge.	Sponge missed. Wound immediately reopened and sponge found. *d.*	Recovery
158	1907	"Russian operator." (53)	?	Gauze compress.	No details. Reported by Neugebauer. Operator did not wish name given. *d.*	?
159	1907	"Polish operator." (53)	?	Gauze compress.	Details not given. Reported by Neugebauer. *d.*	?
160	1907	Sippel. (53)	Broad ligament tumor.	Iodoform-gauze pack.	Six weeks later, the gauze strip passed per rectum. *d.*	Recovery
161	1907	"Berlin operator." (54)	Adnexal mass.	Gauze strip.	Later extracted from the bladder by W. Stoeckel. *d.*	?

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.—CONTINUED.

ABDOMINAL SECTION. SPONGES LEFT.

No	Date of Report	Operator*	Character of Operation	Article Lost	When and How Removed	Result
162	1907	L. Meyer. (53)	Cesarean section.	Mull napkin.	Found at autopsy. Death on fourth day of peritonitis. Sponges counted and "correct." *d.*	Death.
163	1908	? (55)	?	Five foot roll of gauze.	Some months later removed by secondary operation, which was witnessed by J. C. Morfit.	?
164	1908	? (55)	Appendicitis.	Iodoform gauze, 1 sq. yd.	Found at secondary operation in Mount Sinai Hospital. Witnessed by M. G. Seelig.	Recovery
165	1908	? (55)	Appendicitis.	Piece of sea sponge.	Extracted from sinus at Mt. Sinai Hospital, in 1900, by M. G. Seelig.	Recovery
166	1908	Schooler. (56)	?	Pad, 16 in. square.	Details not stated. Patient awarded $1500 damages by a jury.	Recovery
167	1908	Hageboeck. (56)	Appendicitis.	Sponge.	Abscess formation and death of patient. Three trials for $50,000 damages.	Death.
168	1908	Findley. (57)	?	Strip of gauze, 5 ft. long.	Ten days later, found at secondary operation. Sponges counted and stated "correct," but one roll had been cut in two.	Recovery
169	1908	(58)	Ovarian cysts (bilateral).	Two gauze pads.	Removed by secondary operation, six weeks later. Followed by fecal fistula, which finally healed.	Recovery
170	1908	(58)	Pelvic tuberculosis.	Small sponge.	One year later, secondary operation for persistant sinus. Sponge found. Death from operation.	Death.
171	1908	(58)	Gallstone operation.	Small sponge.	Found at autopsy. Death after four days from peritonitis.	Death.
172	1908	Rieck. (59)	Extrauterine pregnancy.	Compress, 15x20 cm.	No symptoms. Four months after operation, compress passed per rectum.	Recovery

173	1880	Mariani. (60)	Ovariotomy.	Drainage tube.	Drainage tube slipped inside and was overlooked. One week later it passed per rectum. *a.*	?
174	1886	Olshausen. (61)	Ovariotomy.	Forceps.	Ten months later passed per rectum, after only two weeks disturbance. *a.*	Recovery
175	1892	"French surgeon." (8)	?	Forceps.	Immediately after the operation, the abdomen was reopened to recover a forceps. *a.*	?
176	1896	MacLaren. (12)	Hysterectomy.	Artery forceps.	Two years later, secondary operation. Found forceps perforating cecum, ileum, and appendix. *a.*	Recovery
177	1896	? (12)	?	Forceps.	Ferrier stated that one of his associates had recovered a forceps left in the abdomen.	?
178	1897	Morestin. (62)	Salpingitis.	Artery forceps.	Three years later, forceps were passed per rectum, after persistent suffering. *a.*	Recovery
179	1898	Herczel. (63)	?	Clamp.	One and a half years later, removed by secondary operation. *a.*	?
180	1898	? (22)	?	Forceps.	Boldt stated in 1898 that he knew of five cases among colleagues, in which a foreign body was left. (Count two forceps.) *a.*	?
181	1898	? (22)	?	Forceps.	See preceding note. *a.*	?
182	1898	? (22)	?	Forceps.	Boldt stated that a pathologist in a N. Y. hospital had found a foreign body at autopsy in two cases. (Count 1 forceps, 1 sponge.) *a.*	Death. Death.
183	1898	? (22)	?	Forceps.	Boldt mentioned two cases in which abdomen was reopened to recover article left. (Count 1 forceps, 1 sponge) *a.*	?
184	1898	Nussbaum. (19)	?	Drainage-tube.	Two months later, patient herself drew it out of an abdominal sinus, after a night of dancing. *a.*	Recovery
185	1898	Bode. (19)	?	Drainage-tube.	Tube slipped into wound and was forgotten. After a few days, wound was reopened and tube found. *a.*	?
186	1898	"American surgeon." (19)	?	Diamond ring.	Remained six months in the abdomen. Other details not given.	?
187	1899	Lassallette. (64)	Large fibroid.	Forceps.	Found at autopsy. Criminal trial. Operator sent to prison. (See Legal Complications.) *c.*	Death.

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.—CONTINUED.

ABDOMINAL SECTION. FORCEPS AND OTHER ARTICLES LEFT.

No.	Date of Report	Operator*	Character of Operation	Article Lost	When and How Removed	Result
188	1900	H. A. Kelly. (31)	Hysterectomy.	Forceps.	Found in drainage tract after a few days In operation to extract it, patient died from hemorrhage. *a.*	Death.
189	1900	G. Braun. (23)	?	Bulldog forceps.	Forceps found at autopsy. *a.*	Death.
190	1900	Sepp. (65)	Ovarian cyst.	Nelaton catheter.	Found in bladder with some silk ligatures, several months later. Catheter had been used to ligate pedicle. *a.*	Recovery
191	1900	Cushing. (23)	?	Seal ring.	Some years after the laparotomy the ring was recovered by incision in vaginal vault. *a.*	Recovery
192	1900	Nussbaum. (23)	?	Artery forceps.	Nine months later, passed per rectum. *a.*	?
193	1900	? (23)	?	Piece of glass irrigator.	Two weeks later found at autopsy by Kyewski. Patient died with symptoms of nephritis. *a.*	Death.
194	1900	? (23)	?	Forceps.	Reeves Jackson mentions a case in which autopsy revealed a forceps left in the cavity. *a.*	Death.
195	1900	Spencer Wells. (23)	Ovariotomy.	Artery clamp.	One month later, the clamp was found in the bladder. *a.*	?
196	1900	Spencer Wells. (23)	?	Artery clamp.	Clamp missed. Wound reopened next day and clamp found. *a.*	Recovery
197	1900	Terrier. (23)	?	Forceps.	Eight days later, forceps was discharged spontaneously from region of umbilicus. *a.*	?
198	900	Terillon. (23)	?	Forceps	Neugebauer states that Terillon forgot a forceps in the abdominal cavity. *a.*	?
199	1900	Winkle. (23)	?	Forceps.	Later discharged spontaneously from an abscess. *a.*	?
200	1900	? (23)	?	Richelot clamp.	Details not given. Simply stated that clamp was left behind. *a.*	?
201	1900	Kosinski. (23)	Ovariotomy.	Artery forceps.	Four months later forceps extracted from an abdominal abscess. *a.*	Recovery

202	1900	Kosinski. (23)	Ovariotomy.	Two artery forceps.	Two secondary operations, in the second of which patient died of hemorrhage. Criminal trial. (See Legal Complic.) *a.*	Death.
203	1900	? (23)	Inoperable tumor.	Artery forceps.	Found at secondary operation by another operator, who related the case to Neugebauer. *a.*	?
204	1901	M. D. Mann. (37)	?	Hemostat.	Removed in one hour after operation. No trouble resulted. *b. c.*	Recovery
205	1901	Schnachner. (37)	Uterine fibroid.	Forceps.	Seven months later, secondary operation for ileus. Forceps found within intestine. Removed by incision. *b. c.*	Recovery
206	1901	? (37)	?	Forceps.	Removed at autopsy, after a laparotomy. Witnessed by J. A. Wyeth. *b. c.*	Death.
207	1901	? (66)	Strangulated hernia.	Forceps.	Eight and a half years later, part of forceps was extracted from an abdominal sinus. Cited by Ellison. *d.*	Recovery
208	1901	Nussbaum. (37)	?	Scissors.	Later, secondary operation. Scissors found. Cited by Senn in letter to Schachner. *b. c.*	Recovery
209	1904	Prochownick. (23)	?	Forceps.	Six months later half of forceps extracted from sinus in scar. *c.*	Recovery
210	1904	? (67)	Myomectomy.	Péan forceps.	Six years later, secondary operation for ileus. Forceps found. Patient died. Reported by Hedlund. *d.*	Death.
211	1906	? (68)	Ovarian cyst.	Forceps.	Seven years later, forceps felt through abdominal wall. Extracted by vaginal incision by Gruzdews. *d.*	Recovery
212	1906	? (68)	?	Forceps.	Secondary operation later by Gruzdews, and forceps found. *d.*	?
213	1906	? (69)	Ovariotomy.	Artery forceps.	Ten and a half years later, secondary operation. Forceps perforating bowel. Reported by Stewart. *d*	Recovery
214	1906	? (70)	?	Artery forceps.	Six years later. death from intestinal necrosis. Forceps found at autopsy within bowel. Reported by LeGendre. *d.*	Death.
215	1906	? (53)	?	Forceps.	Doyen did a secondary operation, and found forceps within intestine. Resection. *d.*	?
216	1906	? (48)	?	Artery forceps.	Four months later, secondary operation by Ward for ileus. Forceps found.	?
217	1907	Dollinger. (53)	Sarcoma of abdominal wall.	Forceps.	Nearly three years later (after two successful pregnancies) trouble from forceps. Operation. Death. Lawsuit. *d.*	Death.

REPORTED CASES OF A FOREIGN BODY LOST IN THE ABDOMINAL CAVITY.—CONTINUED.

ABDOMINAL SECTION. FORCEPS AND OTHER ARTICLES LEFT.

No.	Date of Report	Operator*	Character of Operation	Article Lost	When and How Removed	Result
218	1907	Kuestner. (53)	Cyst of pancreas.	Forceps.	Six weeks later, forceps appeared at angle of scar and was extracted. *d.*	Recovery
219	1907	(53)	?	Forceps.	Found at autopsy. Death soon after operation, of shock. *d.*	Death.
220	1907	? (53)	Ovarian carcinoma.	Forceps.	Found at autopsy. Death after six days, of ileus and peritonitis. *d.*	Death.
221	1907	"Paris surgeon." (53)	?	Piece of an instrument.	Details not given, except that piece was left in abdomen at operation. Criminal trial. *d.*	Death.
222	1907	? (53)	?	Pair of spectacles.	Three operations—in America, Germany, France. Frenchman found spectacles in abdomen. German was sued for damages. *d.*	Recovery

VAGINAL OPERATIONS. SPONGES AND OTHER ARTICLES LEFT.

223	1886	Veit. (71)	Vaginal hysterectomy.	Rubber drain.	Four months later, drain passed per rectum. *d.*	Recovery
224	1886	Veit. (71)	Vaginal hysterectomy.	Rubber drain.	Later expelled from the bladder. Details not given. *d.*	Recovery
225	1897	Friend of H. C. Coe.	Vaginal hysterectomy.	Gauze sponge.	Two days later, on removing clamps, one was found to be a sponge-holder minus the sponge. Laparotomy, found sponge under liver. *a.*	?
226	1898	Erlach. (19)	Vag. operation for fibroid.	Iodoform-gauze pack.	Nine days later, strip found in vaginal abscess. Nine months later, another strip removed from bladder. *c.*	Recovery
227	1898	Boldt. (22)	Vag. drainage after abdom. hysterectomy.	Gauze drain, inserted third day.	Drain forgotten. Two months later the gauze was passed per rectum. *a.*	Recovery
228	1898	Rydygier. (23)	Vaginal hysterectomy.	Sponge.	Seven weeks later, sponge was discharged from vaginal sinus. Patient finally died of pyemia.	Death.

229	1899	Meinert. (25)	Pelvic tuberculosis.	Iodoform-gauze strip.	Five months later, extracted from vaginal sinus. *a.*	Recovery
230	1899	? (25)	Adnexal trouble.	Compress.	One year later, extracted from a vaginal sinus. Cited by Meinert. *a.*	Recovery
231	1899	Schramm. (72)	Pyosalpinx.	Tampon.	Ten weeks later, tampon came out while patient was dancing. *c.*	Recovery
232	1900	Hillmann. (30)	Pyosalpinx.	Gauze sponge.	Found later in bladder, accompanied by violent cystitis. *c.*	Recovery
233	1901	? (37)	Pelvic inflammation.	Sponge.	Later secondary operation (abdominal section) and sponge found in pelvis, by L. Frank. *b. c.*	Recovery
234	1901	Pryor. (37)	Vaginal operation.	Gauze.	Details not given. Cited by W. R. Pryor. *b. c.*	?
235	1901	Assistant to Pryor. (37)	Vag. operation.	Gauze.	Details not given. Cited by Pryor. *b. c.*	?
236	1901	Assistant to Pryor. (37)	Vag. operation.	Gauze.	Details not given. Cited by Pryor. *b. c.*	?
237	1902	?	Uterine tumor.	Tampon.	Four months later, tampon was extracted per vaginam. Reported by Gudbrod. *d.*	Recovery
238	1906	Brothers. (48)	Vaginal hysterectomy.	Gauze drain.	Several months later, drain was extracted through vaginal sinus.	Recovery
239	1907	MacLaren. (51)	Pelvic suppuration.	Iodoform-gauze strip.	Two months later, the patient extracted a twelve-inch strip of gauze from vagina.	Recovery
240	1908	Calmann. (59)	Vaginal hysterectomy.	Sponge, slipped from holder.	Extensive palpation per vaginam, extending to liver and kidneys. Not found. Removed later by laparotomy.	?

a. Cited by Neugebauer, 1900.
b. Additional cases, cited by Schachner, 1901.
c. Cited by Neugebauer, 1904
d. Cited by Neugebauer, 1907.
**Supposed to be the operator. In some cases the record is not entirely clear on this point.*
†In a few cases, reports obtained from different sources were contradictory, making it difficult to determine positively certain details, where the original report was not accessible.

Realizing the insecurity of the tape method in common use, many surgeons now have their sponges made two or three feet long, instead of square, with the idea of keeping one end outside. This reduces the danger, but does not eliminate it. It is very easy for these ends to slip in unnoticed. This is not a mere theoretical danger. Neither is the occurrence of the accident confined to emergency operations nor to inexperienced operators. It has happened to some of the best operators and in the best hospitals. Even the large roll of gauze for holding back the intestines is not exempt. In a hospital which has the deserved reputation of being one of the most careful and systematic in the world, the long five-foot roll, for packing back the intestines, was lost in the cavity, necessitating a secondary operation some time later for its removal.

Elimination of Detached Sponges.—This is accomplished by the use of ten-yard and five-yard gauze strips in the practical manner previously explained in this paper. This is a radical departure in preventive methods, in that it strikes at the root of the trouble by entire elimination of the dangerous detached pads and sponges. Furthermore, it is automatic in action. It does not require special attention on the part of the operator or assistants or nurses. Neither does it require cumbersome apparatus nor special materials. The strips and bags may be prepared anywhere by anyone from common materials. They are compact, simple and inexpensive.

When familiar with the use of this method, the apparent inconvenience largely disappears. However, the question is not one of perfect convenience, but of safety for the patient and for the surgeon. In spite of the natural opposition to any radical change in long-established technic, the profession will, I think, necessarily adopt some such safety method sooner or later—perhaps not just in the form here presented, but in some form embodying these principles of automatic action, simplicity of preparation and materials, inexpensiveness, convenience in use, universal applicability and absolute security under the varied circumstances of abdominal work.

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DISCUSSION.

DR. HERMAN E. HAYD, Buffalo.—It is always interesting to hear something new, and I do not wish to disparage what Dr. Crossen has done or what he has tried to impress us with; but honestly, I cannot see, from what he has said, the philosophy of adopting this method of preventing very serious accidents in leaving sponges and other foreign bodies in the abdominal cavity. In the first place, the older I grow, the more I have endeavored to simplify my work. I have endeavored to use as few instru-

ments as possible; to use as little gauze as possible; to sponge as little as possible, and by that means I am enabled to do my work with greater despatch and necessarily with a very much smaller mortality.

I would like to see Dr. Crossen work with the method he suggests. I am not going to criticise the plan at all, but so far as it appeals to me it seems very clumsy. It must be also dangerous, in that he has to draw his ten yards of cotton out of the wound, and, at the same time, the other end dangles on the floor or in a vessel, touching the table, touching his gown, and everything else that is possible to have about the operative field. And then, in the second place, in smaller hospitals—while it might work well in Saint Louis and in hospitals in other large cities —I am afraid it would not be a general success. In smaller hospitals the question of expense enters very largely into their management, and if we used such an amount of gauze in each operation as Dr. Crossen suggests the cost would be too great.

So far as these deplorable accidents are concerned, I am satisfied the profession has been unduly modest when Dr. Crossen reports but 167 cases where foreign bodies have been left in the abdomen. The number of such instances must be much greater than he has given. I do not believe that there is a man of large experience as a surgeon who has not left a sponge or an instrument in the belly cavity at some time or other. I have done it; others have done it; consequently I agree with the essayist that we should try to eliminate this danger as much as possible, and one way to eliminate it is to simplify one's technic, use as few sponges as possible, use as few instruments as possible, and have as few assistants as possible in an operation. Notwithstanding all that, it is possible for us to have accidents for which we are not really responsible, as, for instance, the breaking of instruments with hinges and springs on them, such as a needle holder and the like. The piece might not be missed and then found at later operation.

I wish to thank Dr. Crossen for what he has done. I should be pleased to see him handle this large amount of gauze; nevertheless, what he has said about the method does not impress me favorably.

Dr. John William Keefe, Providence.—I wish to mention a method for walling off the intestines that appeared to me quite simple and one which I have adopted for the last two years. I use a rubber sheet similar to that which dentists call a rubber dam. This rubber sheet is about nine inches wide by twelve or fourteen feet long. It can be sterilized by boiling; on account of the powder that sometimes adheres to the rubber it is washed with normal salt solution and rolled. It is then placed on a sterilized sheet on the abdomen and gradually introduced into the abdominal cavity as occasion requires, thus walling off the intestines. I have used it in gall-bladder surgery and in the surgery of the pelvis. When a portion of gauze is in contact with the

peritoneum for any length of time we are certain to get more or less peritonit s as a result, and some of the adhesions that form later are due to the gauze having been in contact with the peritoneum during the operation. Now, as this rubber has an absolutely smooth surface and is moist, it will not adhere to the intestine.

I have used this for fully two years and have found it very satisfactory. I leave nothing in the abdominal cavity but the roll of rubber.

Dr. Roland E. Skeel, Cleveland.—I would like Dr. Crossen to indicate how he uses these small strips when he has the abdomen open, especially in cases of intestinal anastomosis and gall-bladder work, in which there is pus, and how he uses the sponges to avoid contaminating the remainder of the abdominal cavity. If this method can be used in gall-bladder and intestinal work without contaminating clean surfaces it would seem to be unusually applicable in abdominal surgery.

Dr. Charles L. Bonifield, Cincinnati.—I rise to emphasize what Dr. Hayd has said in reference to simplicity being the price of success in operations, and therefore I think Dr. Crossen's method is too cumbersome In abdominal operations we often pay too much attention to one feature and ignore others. Few of us would feel safe with the end of yards of gauze contaminated with pus or other infective material hanging down to the floor, and the other end attached close to the incision. If there were no other way by which we could reasonably assure ourselves of not leaving a sponge in the abdominal cavity, the method of Dr. Crossen might be adopted; but there are other ways which are comparatively safe, and it is better that a sponge be left once in a while than to adopt a method to prevent it that is so cumbersome that it unduly prolongs all operations or interferes with one's aseptic technic. If in packing away the intestines from the pelvis, one uses one or at most two very large gauze sponges, there is little danger of leaving one behind. A gauzé sponge two or three yards long can always be found. If we never use small sponges after the peritoneum has been opened, there is little danger of leaving one.

In regard to gall-bladder surgery, the same principle applies. If we first surround the field of operation with one large sponge and pack all smaller pieces inside this large one, there is little danger of losing any. These precautions, with the help of a trustworthy nurse to keep count of sponges, reduces the danger of an accident to a minimum.

Dr. Francis Reder, St. Louis.—I am inclined to think that the method which has been suggested by Dr. Crossen is like everything else, one has to get used to it. I have seen him use his method. It rather appealed to me, and I presume that if some of the Fellows of this Association could see him make use of the method, it would appeal to them. I do not think that an irritable operator would content himself by using this method of sponging. The mere idea of having a strip of gauze dangling

from the wound would be sufficiently annoying to cause him to discard the method. So far as the use of small gauze sponges is concerned, I may say that these small pieces of gauze are only used for superficial sponging and are not intended for any other use.

Dr. John A. Lyons, Chicago.—I would like to accentuate the remarks made by Dr. Hayd with regard to simplicity. In a large hospital experience I have noticed that simplicity is what surgeons are striving for. I do not think surgeons of to-day are leaving sponges, artery forceps, and the like in the abdomen as frequently as formerly. I am surprised to hear that there are thousands and thousands of such cases. I recall one case that came under my observation in which there were five or six pieces of gauze drains left in a case of pyosalpinx, and the house surgeons in withdrawing them overlooked one. In some way this drain got under the abdominal wall and was not removed. A month or so after the patient had left the hospital I was very much annoyed to find a fistulous opening there which would not close. I put her under an anesthetic at home, and to my surprise removed a large full-sized piece of this gauze. The wound closed completely and at once. After this the patient did well. Our technic should be as simple as possible. We should use as few sponges as possible, counting them before they are introduced and after they are withdrawn, and if we are exceedingly careful to remove all of the gauze we introduce, we will not have as much trouble in the future as we have had in the past; in fact, none at all of this character.

Dr. Walter B. Chase, Brooklyn.—"Eternal vigilance is the price of liberty," and that rule applies to surgery as elsewhere. I am sure it has been a practical question with every man who does surgical work not to miss a sponge or leave it in the abdominal cavity after an operation. We know, however, that foreign bodies have been left in the abdomen after laparotomies so that it has become necessary to reopen the abdomen afterward, with consequences most disastrous, leading in some cases to suits against the operator for damages. It has never been my misfortune to have had that accident, and whatever method will accomplish this purpose in guarding against such a misadventure is the one that should be adopted; but I fancy it is not possible to expect every operator to pursue the method some other man follows. A man should be exceedingly careful in what he is doing. He should have some method, whether by the use of addition and subtraction, whereby he can keep track of all sponges. It seems to me, that while the method that has been described may have merit in it, it hardly appeals to me.

Dr. Hayd spoke of simplicity in connection with all operations which is of paramount importance, saying that we should use as few instruments and as few sponges as possible; but if we will make it a rule in abdominal surgery never to place inside the abdominal cavity a piece of gauze or a sponge except it is large

or attached to a sponge holder, charging your mind with that fact when you begin, and having your assistants appreciate it, you will not be likely to leave it behind. I did not catch the drift of all of the remarks of the essayist, but I think it is largely a question which the individual operator must decide.

Dr. Crossen (closing the discussion).—I want to thank the Fellows for their free discussion. The question of simplicity in surgery is one of the most important with which we have to deal. It seems to me that two dozen large sponges and a number of smaller ones are a much greater departure from simplicity than five strips of gauze. It is the simplicity of the method on which I laid stress. With this plan we use only five strips of gauze, and with these strips all the sponging is done. There is no running here and there for sponges or calling for them; the sponge is always within reach. This is simplicity itself, compared to the ordinary method with numerous detached sponges.

I expected criticism. This method is a radical departure from the usual technic. We are all inclined to get into a rut—to settle down comfortably into a routine and to object strenuously to being disturbed. It takes a great deal to jar us loose from the accustomed routine, but it seems to me that the continued occurrence of this deplorable accident should be enough to show the necessity of a radical change. It is high time we adopted some method that is really effective and generally applicable. Such is the method presented in the paper.

Practically all the points of criticism mentioned by the speakers have been brought out in previous discussions of the subject, and are answered in the portion of the paper dealing with "special points," which could not all be read on account of the limited time. The troublesome "dangling," mentioned by some, is a theoretical objection entirely. I have used the method now for two years, and to-day in this discussion is the first time I have noticed any troublesome dangling.

I was much interested in the remarks of Dr. Hayd. From the freedom of his criticism, I expected him to tell us some better method of preventing this serious accident. But he did not do so. The time-worn injunctions to "use few sponges" and to "watch everything closely" are very good as far as they go, but they do not go far enough to properly protect the patient, as is clearly shown by the facts presented in the paper. In such serious work the surgeon cannot watch everything. It is an impossibility, and the sooner this fact is realized the sooner will effective steps be taken to protect the patients automatically and with absolute certainty.

We have largely eliminated hemorrhage and sepsis in abdominal work, and now we must try to eliminate the danger of leaving a foreign body in the peritoneal cavity. This is a serious matter. I feel that we have no right to subject a patient to danger of death from this cause simply because it is more convenient. Sooner or later we must adopt some really effective safety measure, and the sooner the better.

THE MOBILITY OF THE PATIENT AFTER LAPAROTOMY.

BY

WALTER B. CHASE, M. D.,

Brooklyn.

MUCH has been written and more has been said about the governing principles and the technic of abdominal surgery in all its bearings; but it is my purpose to speak of one feature of postoperative laparotomy—that of the mobility of the patient; and that will embrace both passive and voluntary exercise. At the best the patient unavoidably suffers more or less annoyance and pain succeeding the operation, continuing a longer or shorter period according to the circumstances of the individual case, and this fact imposes on the operator an obligation to minimize the suffering.

In the early period of abdominal surgery, great attention was paid to the physical quiet of the patient, and rigid measures were adopted to insure immobility, both active and passive, as essential to the best result. Longer experience has demonstrated the needlessness and injury of such extreme restriction. Then and, too often, now no latitude was given to the inclinations of the patient; but rigid immobility was ruthlessly enforced. After the operation the patient was placed flat on the back, the hands kept under the blankets, the head lowered to the level of the body, and the legs were maintained fully extended. This was a refined species of cruelty, needless and injurious, and only equaled by Treves's deadly thirst considered as essential to the highest chances of recovery after abdominal section.

Such directions, and many less arbitrary, should find no place in the after-management of laparotomies. The supporting of the head on a pillow is a most gracious relief to the tension of the recti muscles, and such mobility of the trunk and the extremities, active or passive, as will tend to the actual comfort of the patient; particularly the rolling of the patient from side to side, be it never so little, supported with incompressible bolsters under the mattress, together with elevation and support of the knees to relieve abdominal tension, are both reasonable and salutary, when allowed under proper precautions. Such has

been my practice for years. But now the reaction has gone dangerously far in the opposite direction, until some surgeons advocate and practise having the patient sit up the day after the operation and walk about the room the succeeding day, allowing the patient to leave the hospital at the end of the week. It is this radical innovation to which I raise a protest; and for reasons which I believe are rational and logical and in keeping with the physiologic and pathologic conditions present.

The cardinal prerequisites for the prompt healing of wounds are perfect coaptation, perfect rest, and freedom from infection; and whatever tends to interfere with such results deserves unqualified condemnation. In intestinal anastomosis, and when intraabdominal suturing is needful, on structures more or less pathologic, voluntary movements of patients must be restricted. The contractility of the recti and transversalis must be diminished by adhesive plaster or the many-tailed bandage. The muscular contraction incited by active or passive motion is not lost or obliterated, but with every degree of mobility of the trunk the healing process may be disturbed.

In the light of experience every operator knows that whether from conditions intrinsic to the case, or from anatomical or accidental causes, hernias from imperfect union too often mar the result of an otherwise satisfactory operation. The time required for healing of the external structures in abdominal sections, must be considered. There is authoritative basis for the statement, that under favorable circumstances the healing of these structures by first intention may be completed in eleven days, but a somewhat longer period is requisite for this process to have acquired its full measure of resistance to muscular contractions, either active or passive.

In view of this fact, it seems remarkable that sound judgment consents to the early mobility of the patient in getting up or out of bed. If healing is delayed from any cause, then the time in which mobility, either partial or complete, should be permitted, would depend on the individual case. Doubtless time will give us more information in the relation to the frequency of imperfect scars and in the development of hernias from these causes. As pertinent to the healing of wounds which involve the peritoneum, the experience and result obtained in hernia operations at the New York Hospital for Ruptured and Crippled is most instructive, and demonstrates how immobility of the parts by the application of plaster or other immovable dressings has yielded

results so conservative and satisfactory as to make comment unnecessary.

In the present status of this subject there are two distinct and divergent views, both having distinguished adherents, and both claiming superior advantages. Without going far in analyzing these conflicting views, those who favor their patients sitting up the day after laparotomy and on the morrow to go about the wards of the hospital, have come forward with the allegation that long-continued rest in a horizontal position tends to the development of thrombosis, embolism, or phlebitis.

Boldt makes such a statement which is tentatively indorsed by Polk, and quotes the Mayos as confirming by their observation the diminishing percentage of these complications of these patients getting up within a week from the time of operation. The doctrine of Reis is well known in this relation. This is the crux of the whole matter. Does the early getting up of the patient bear a fixed and determinate relation to these complications? Is it a question of the mechanism of circulation or of pathologic change which is responsible for these accidents? If an authoritative answer to this problem is to be found it must be answered by experience and by histologic and pathologic demonstration.

As regards the matter of experience, every operator, with little or much observation, instinctively turns to his individual experience, the influence of which is one of the most precious guides to right deduction and without which he would become an automaton. When one observer compares his own with another's experience, some light will shine on the point in dispute, and when the combined experience of many is analyzed more valuable deductions may be drawn. In appealing to my own experience, I find I have had but one case of phlebitis following abdominal section. During a much shorter period I have known some operators who have had a discouraging percentage of this complication. A pertinent inquiry forces itself on the attention of every operator, whether these cases of phlebitis are not of infective origin, and that the supine or upright position of the patient can be but a contributing factor in the problem. Such a conclusion appeals to me as probable and altogether logical. It needs no prophetic vision to trace the causative relation which exists between phlebitis and thrombosis eventuating in embolism.

Observers like Noble, Baldy, and others declare phlebitis is not due to prolonged horizontal position in bed. An eminent pathologist has expressed to me his belief that early getting up

after abdominal section enhances the risk of thrombosis and embolism and that the accident of phlebitis is due to infection and not to blood stasis. The risk of the accidents mentioned are by no means the only ones to be encountered. Within the year an operator of standing presented several patients to one of the largest medical societies in Greater New York as demonstrating the safety of allowing patients to sit up the day after the operation and be about the hospital the second or third day. No one questioned the accuracy of his statement, but he did not suggest that a committee of the society be asked to examine these several cases and report on the healing of the abdominal incision and the strength of the abdominal wall.

No one doubts the prompt union of the abdominal incision with the patient out of bed in certain cases, but that such results warrant the inference, or that routine practice justifies the rule that it is better for the patient to be out of bed before the expiration of a week, lacks demonstration. Doubtless both imperfect abdominal support and too early mobility of the patient are frequent exciting or contributing causes for weak abdominal walls and resulting hernias, which are the opprobria of the surgical art. In proportion as the abdominal muscles are quiescent, other things being equal, will healing be facilitated. Mechanical support of the abdominal wall and freedom from voluntary mobility of the body are the prime factors which influence such restoration of the parts. This becomes more apparent when we consider other influences which defeat union of the abdominal incision. Apart from voluntary motion, infection at the time of the operation may be unknown to the operator, together with unknowable intrinsic conditions of the structures which retard or prevent primary union. These may not become apparent until after the lapse of several days, and their injurious influence may be much exaggerated by getting the patient in an upright position during such period. Long-continued illness, apart from ailments for which the operation was necessary, often requires protracted rest in bed.

These rules apply equally to septic cases in which drainage was had through the abdominal incision. Again, unexpected and sudden death from grave complications and suits for damages, the result of assuming the upright position a few days subsequent to the operation, due, it may be, to causes which, wholly or in part, were independent of the disease for which the operation was done, must restrain the conservative operator in pursuing a

course, which has in it so much that is fanciful and so little that is practicable. When the physical and pathological rules bearing on these conditions have been properly adjusted, it is confidently believed a middle ground will be found on which all but extremists can stand. In the majority of patients active exercise out of bed may be allowed during the third week after operation; others will make a satisfactory getting up somewhat earlier, while with others a month must elapse. This is a matter of judgment in an individual case. One of the mischievous influences, which has grown out of the new dogma, is reflected in the sentiment of occasional operators who apparently cherish a belief that they are adding to their reputation by reporting that their cases are up and out at the end of a week.

DISCUSSION.

Dr. Albert Goldspohn, Chicago.—I cannot resist the impression or belief that the principal motive on the part of men who advocate the early getting up of patients after operations, is very much the same as that of the grocer when he advertises sugar for less than it costs him in a show window. It is something of a novelty, something to attract attention. That kind of notoriety, I think, honest and scientific men had better not seek. We should not indulge in advertising in that manner or any other.

As to the impropriety and utter wrong of stimulating these patients to get up on the second or third day after operation, there can hardly be any question if we consider the principles of the healing process, of either primary or secondary union, and the minute processes that go on in or about a ligature or suture whether it be absorbable or nonabsorbable. We operate for a more important purpose than of merely getting a primary union of the abdominal incision without a hernia afterward.

The greatest degree of good results to the internal organs operated upon is our chief concern, and these internal and more delicate parts suffer more from such early ventures with the erect posture than does the outer incision. In order to obtain more nearly perfect results, it is evident that we need more than adhesion of parts newly approximated, reinforced by sutures and ligatures. Cicatrization should be well advanced or completed, and that requires more than ten days.

I think we have erred in keeping some people in bed unnecessarily long. Even if that were the case, how much have they been harmed in health, in head, in extremities, and trunk? What injury has come to their muscular frame or osseous frame from lying in bed a few days longer than was actually needed? What happens to those people when they lie in bed with fractured limbs? Do they emaciate terribly in a few days? Does lying in bed take away their strength, impair their health, or weaken

their vitality? I fail to see it. So I think a medium ground in this, as in many other propositions, is likely to get more near the truth. Extremes in either direction are a mistake, and the extremes of stimulating and prodding patients to get out of bed early after operations are advertisements to be avoided.

Dr. Daniel H. Craig, Boston.—With reference to Dr. Chase's remarks regarding postoperative phlebitis and thrombosis, it may be remembered by some of you that my name was on your program a while ago for a paper on this subject I was unavoidably detained and could not read that paper, which was intended as a preliminary report only, and while I do not wish to anticipate, I had hoped that some time I might give you a complete paper upon that subject. From what observations I have made, I can safely say at the present time that mobility of the patient after operation certainly has a relationship to the postoperative complications of phlebitis and thrombosis, and I think the early mobility of patients lessens liability to these complications. However, I shall not enter into the details of that now. I have established in my own mind that the old dictum that infection is the cause of postoperative phlebitis and thrombosis is not necessarily true. It may be true in some cases, and for a long time there was a middle ground in which all the other fellows' cases were infectious and ours were not. I now think that some of ours were infectious, and some of the other fellows' were not.

It seems to me that to argue as to an arbitrary time for keeping a patient in bed after operation, whether a long or short time, is entirely wrong. If we are going to lay down a rule for the government of tyros in the profession, we had better lay down rules to keep patients in bed for a long time; but if we are going to laydown rules for the use of competent surgeons, the individual man's judgment in the individual case must be the rule. I think it is perfectly safe to allow some patients to get up early after operation, not necessarily the next day, and that it is absolutely unsafe to allow other patients to get up early, and that must be the basis on which we should work. For months I have allowed certain patients to get out of bed on the third day after operations; others were allowed to get out of bed a day or two later. I have kept some patients in bed twenty-one days after operations. Either rule would have been extremely fallacious if applied to the other patient. It is not possible to lay down a rule that will apply to all cases.

One of the wisest guides, other things being equal, is the patient's expression of inclination to get up after operation. Given a patient with on elevation of temperature, with no acceleration of pulse, with healing of the wound, and everything in a perfectly satisfactory condition, if that patient feels well enough and expresses an inclination to rise, other things being equal, I let her rise. If she does not suggest it, I seldom urge her to do so. On the other hand, I think it is perfectly safe to keep these patients in bed if we do not keep them there too long.

ECTOPIC GESTATION WITH VIABLE CHILD; WITH REPORT OF THREE CASES.

BY

X. O. WERDER,

Pittsburg.

WHILE ectopic gestation is a comparatively common occurrence, the fetus rarely survives the first two or three months of its existence. Rupture of the ovisac usually takes place within the first two months of gestation, and with it or even before that the fetal life is terminated. Occasionally, however, through some fortunate accident, the ovum is not completely detached, at the time of rupture, from its original site and the placental circulation remains undisturbed. In such instances new attachments between the ovisac and the structures with which it is brought into contact are formed, enabling the fetus to survive the catastrophe and to continue its growth until it reaches the period of viability, unless a new or secondary rupture terminates its existence before that advanced stage of development is reached. In spite of the most unfavorable conditions in which the ectopic fetus finds itself placed under such circumstances, cases in which the viable period has been reached are no longer so extremely rare as Sittner ("Ergebnisse der in den letzten 20 Jahren durch Köliotomie bei lebendem Kinde operirten Fälle von vorgeshrittener Extrauterinschwangerschaft," Archiv für Gynäkologie, vol. lxxxiv, Heft 1) has recently been able to collect 145 cases from literature in which a living fetus of viable age has been delivered by means of operation. This number could be greatly multiplied were the cases considered in which dead fetuses of advanced age, either macerated and decomposed or in the form of lithopedion, have been removed by operative intervention.

Extrauterine pregnancy with a viable fetus is still, however, of sufficient rarity to command more than passing interest, particularly as there are many questions, especially in regard to the treatment, which have by no means been finally settled, and any case of this character may, therefore, help to contribute to a more definite knowledge of this freak of nature and its successful treatment. It is for this reason that I wish to put on record the

three cases which it has been my unusual fortune to see during my experience and to give the result of their operative treatment.

As the first case was fully reported in the *New York Medical Record*, November 24, 1894, and in the Transactions of the American Association of Obstetricians and Gynecologists, only a brief review of the most important features will be submitted.

CASE I.

CASE I.—Mrs. F. McC., age thirty-five, referred by Dr. Wallace, of East Brady, was admitted to Mercy Hospital, January 23, 1894, when the diagnosis of extrauterine pregnancy with living fetus of six months was made. Operation was deferred in the interest of the fetus until April 4, when she was delivered by abdominal

section of a living child. It was contained in a sac to which numerous loops of intestines were adherent and which terminated between the folds of the broad ligament. The attempted extirpation of the sac was interrupted by a frightful hemorrhage from the placenta; while my assistant used sponge pressure over the placenta, I rapidly clamped the ovarian artery in the left infundibulo-pelvic ligament and with another forceps clamped the branches of the uterine artery along the left border of the uterus, which at once controlled the hemorrhage so that the placenta, which was spread out over the spinal column and the right posterior wall of the pelvis, could now be separated with comparatively little loss of blood. It was, however, impossible to extirpate the sac entirely, as a portion of it was so firmly attached to the intestines that a complete separation had to be abandoned. The freed portion of the sac was then excised and the remainder gathered and drawn together, sutured to the parietal peritoneum and its cavity drained by a strip of iodoform gauze. The abdominal incision was then closed, excepting at the point of drainage. The patient made a smooth and interrupted recovery, and has enjoyed good health ever since. The child, though considerably deformed, was strong and showed considerable vitality and did well for two days. On the third day, however, it became very restless, its breathing became rapid, temperature rose to 104°, in which condition it continued until its death four days after delivery. The cause of death was supposed to be pneumonia, though no autopsy was held.

CASE II.—Mrs. R. B., age twenty-four, referred by Dr. Gentry, was admitted to Mercy Hospital on November 30, 1896. Diagnosis of ectopic gestation at seven and one-half months was made.

Family history negative. Puberty at fourteen, menstruation always regular and painless. Married four years. She had one child twenty-one months ago, labor was very easy and convalescence normal. No miscarriages. Has never been ill of any account. Present illness began in April, when she missed her period, which, however, reappeared May 18. Previous to April, her menstruation had always been very regular.

In September she was compelled to go to bed with "inflammation" for four weeks, and at that time she first discovered quickening. Pains have been very severe since September and more or less constant. On examination the shape of the abdomen was found to be very peculiar and irregular. It contained a large mass about the size of six months' pregnancy filling out the right

quadrant more prominently than the left one. Fetal movements could be distinctly felt by abdominal palpation and fetal parts could also be palpated, especially the head, of which the anterior and posterior fontanels were especially well-marked. The fetus apparently occupied a rather transverse position in the abdominal

Case II.

cavity. Bimanual examination shows the cervix to be soft and flabby and with old lacerations. Parts of the fetus can also be very plainly palpated through the vaginal fornix. The uterus was slightly enlarged and pushed to the left. The point of separation between the uterus and gestation sac could be distinctly

felt up to the fundus, excepting at the right cornu. The vagina had a decidedly purplish hue. Fetal heart sounds are most distinct below and to the right of the umbilicus. The patient was thin, anemic-looking, poorly nourished and rather feeble; pulse 100 and above and very compressible.

Operation, December 14, 1896. The abdomen was opened freely and the sac exposed. It was found adherent all around, excepting on its anterior surface. The sac was then opened and the fetus rapidly delivered, scarcely one ounce of amniotic fluid escaping from the incision. The placenta was situated in the lower portion of the sac, spread out over a large portion of the pelvis. Without disturbing it, I at once began separating the sac to the upper portion of which the intestines were adherent. Unfortunately, neither the ovarian nor the uterine artery was accessible, and the plan to secure these vessels, which in the first case had proved so signally successful, could not be carried out at this stage of the operation. We continued, therefore, to free the sac until the placental site was reached, when a terrific hemorrhage interrupted our efforts. Towels and sponges were used to make pressure upon the placenta, and my assistant also compressed the aorta, while I rapidly finished the extirpation of the sac and placenta with the adherent uterus. The appendix was also found adherent to the sac and had to be removed.

As a large quantity of blood had been lost and the operation was quite tedious, the patient left the table profoundly shocked and with a pulse of one hundred and eighty. In spite of very free stimulation during the next two days she succumbed on the third day after operation. The child's arms and legs were slightly deformed, similar to the first case but to a less degree, but it was more poorly developed, small and very feeble and survived the delivery only a few hours. As this specimen disappeared in some unaccountable manner before a very careful investigation of it had been made I am unable to give a detailed description of the sac and placenta.

CASE III.—Mrs. T. L. M———. Thirty years old. Referred by Dr. Burns, of Washington, Pa. Admitted to Mercy Hospital on September 19, 1907. Diagnosis of ectopic pregnancy at about six months. She has had three children, the youngest four years of age. Last normal menstruation, March 13, 1907. In April she had a slight show which kept up almost the entire month and was accompanied with considerable cramps at times. May 1 she had sudden severe pains in

abdomen, which was followed by a slight show lasting only a few minutes. No show at all in June until she had a "miscarriage" about the middle of the month, which was, however, not accompanied by much hemorrhage. Curetment was performed on June 22, cleaning out much placental tissue. Pains kept up in spite of all though she was able to be up and around. For the past four weeks she has felt life and feels a "lump" in the left side. She has not seen any menstrual flow since June.

On examination made by me on September 4 I found the abdomen enlarged to about the size of five months' pregnancy

Case III.

the tumor extending closely up to the umbilicus and more prominent on the left side of the abdomen, which it fills more completely than the right side. Fetal movements are very distinct. The uterus is soft and enlarged and posterior to the fetal tumor but apparently attached to it by the upper anterior surface of the fundus. To the left of what seems to be the fundus is another smaller mass about the size of a goose-egg, soft and attached to uterus and fetal tumor. The fetal tumor is firm and solid and pretty well out of the pelvis. Dr. Burns stated to me subsequently that at the time of curetment not only placental tissue but also a small fetus was removed from the

uterus, so that there could be no doubt of a uterine pregnancy complicated by an ectopic.

Operation October 17, 1907. After a free abdominal incision extensive omental and intestinal adhesions (several loops) covering the whole upper aspect of the sac, and also anteriorly and laterally, especially on the right side, were carefully separated. These adhesions were not firm excepting on the upper surface. The tumor was now bare and was carefully inspected. The sac itself was of milk-white appearance, very tense and extended down to a little below the brim of the pelvis. On the right side the sac was evidently covered with peritoneum derived from the broad ligament, containing immense bloodvessels, some finger-thick, running from the pelvis up the right lateral part of the sac to its upper portion. As these vessels were thought to supply the placenta the whole bundle was carefully tied with a double catgut ligature, by passing a slender hemostatic forceps between them and the sac, thus drawing the ligature under the vessels. This mass of vessels was then divided between the ligatures. The sac was then carefully opened in the middle upper portion when the back of the fetus was at once exposed, very little amniotic fluid escaping. The opening was rapidly enlarged with the fingers, the fetus extracted and the umbilical cord, after clamping, divided. The head of the fetus occupied the left lower portion of the sac, while the trunk was in the upper portion curled up in a semi-circle, the lower extremities and the arms occupying the cavity of the circle.

The placenta was now found in the lower portion of the sac quite intact and perfectly dry. The posterior aspect of the sac was now delivered from its adhesions until it could be safely removed from the abdominal cavity. It was now found that the whole sac was attached to the right side of the uterus; the pedicle consisting evidently, partly at least, of the right adnexa and broad ligament, the latter being of course very wide, vascular and thick near its uterine attachment. The pedicle was then securely clamped by three-clamp forceps, cut and tied in sections by a number of heavy catgut ligatures. The only bleeding of any consequence encountered was right in the beginning when separating omental and intestinal adhesions from the sac. The rest of the operation was very much the same as an ordinary ovariotomy with adhesions. It was easy beyond all expectation. The abdomen was closed without drainage. The patient stood the ordeal very well and left the table in good condition. Her

convalescence was easy and smooth and not marred by the slightest complication or disturbance. She has been in good health since. The child lived about one hour.

Report of Dr. Robinson, Pathologist of Mercy Hospital.—Anatomical description: Specimen consists of a fetus, white, female sex, and of placenta. The former measures 39 cm. in length, and has 10 cm. of the umbilical cord attached to which is clamped a forceps. The cranial vault is normal. The left ear is folded on itself, the posterior half covering the anterior half. The left side of the lower jaw rests on the folded arms and has been distorted by pressure so that the face is disfigured. At the base of the second and index finger of the right hand is a reddened discoloration probably from pressure necrosis. The legs are folded and show evidence of pressure which has produced deformities. The right leg lies over the left, the thigh being flexed on the body, the leg directed downward and to the left where the ankle meets the middle of the left leg. Here it is bent around the left leg, the convexity being a little above the ankle on the lateral outer aspect. This produces a marked inversion of the foot and when the leg is extended talipes equinovarus. The opposite leg is more deformed, having adapted itself to the position of its fellow and being beneath suffered greater pressure. The portion above the ankle and for half the distance to the knee bears a depression and the tibialis anticus is atrophied here. The foot is acutely everted and flexed forming a talipes calcaneovalgus. At the flexure in the outer right side is a brownish-black pigmentation. The labia are very prominent, the labia minora protruding between the labia majora. The hair of the head is plentiful and the lanugo covers the body, being especially plentiful over the shoulders.

The placenta measures 15 cm. in diameter having a portion of umbilical cord attached. Four cm. from one margin the amniotic sac is divided equatorially and reflexed. Several prominent bloodvessels and some minor ones are seen coursing over the fetal surface of the placenta. On the reverse, the tissues are deeply congested, irregular and roughened by numerous delicate fibrillæ or broad fibrous tags. Near the latero-central portion is a prominence of firm, pink substance resembling uterine musculature. Directly beneath is a ridge of firm flexible nature seeming to be continuous with the outer surface of the protuberance mentioned and suggesting the broad ligament in its position and formation. Behind and below the prominence is a semilunar

mass, yellowish-pink in color, suspended like a hammock, apparently the ovary. At the outer and upper end of this mass is an irregular rope-like, elongated mass ligated at two places with catgut. At the thickest portion of this mass the more or less patent ends of dilated bloodvessels are seen. This rope-like process extends in a long loop diminishing in size until it reaches the area of what is probably the broad ligament and at this end shows tortuous bloodvessels beneath the peritoneum.

A flattened, pyriform mass accompanies the specimen having been discharged from the uterus by the vaginal route the day following the operation. It is firm, deep red, thickened at the narrow portion and thin at the large end, with a yellowish-white membrane within which some yellow flocculent material is seen. It is evidently a cast of the uterine cavity formed by decidua and endometrium.

That all these cases began as tubal pregnancy can hardly be questioned. The time of rupture can be estimated from the history of every case. In the first case it occurred at about the end of the second month; in the second case it seems to have occurred unusually late, about the middle of the fourth month, and in the third case severe cramps about six weeks after the last menstrual period would indicate that rupture took place at that time, though the complication with normal pregnancy and a subsequent abortion causes the symptoms to be rather mixed and consequently less definite than in the previous cases. In none has there been any evidence of a secondary rupture, though what seems to have been the primary rupture in the second case may in reality have been the secondary one, which would account for its late occurrence. In all these cases the fetus was contained in a distinct sac, in the last one possibly in its original amniotic covering. They all contained a scanty amount of amniotic fluid, not more than a couple of ounces at most and the sac in all these cases was tightly drawn around the fetus. The placenta, which in all ectopic cases is considerable larger apparently than in a normal uterine pregnancy, was spread over a large area. In the first two cases it involved even loops of intestines, but fortunately not very extensively so that its enucleation aside from the hemorrhage proved technically difficult only in the second case.

In none of these cases was the diagnosis attended with great difficulty. In the advanced form of extrauterine the only other condition with which it might be confounded is normal uterine pregnancy. Mistakes in diagnosis are therefore less likely to

occur than in the earlier forms of ectopic gestation, though even the latter cases are not usually difficult to recognize The peculiar, irregular outline of the tumor, the very easy palpation of the fetus which seems to be almost directly under the skin of the abdomen, and the very audible heart-sounds as compared with uterine pregnancy, are such characteristic features of the extrauterine location of the child that they alone would suffice to attract our attention In addition to this in the first two cases a part of the fetus occupied the lower portion of the pelvis and was so easily felt by the examining finger in the vagina, that it appeared that only the mucous membrane of the vaginal fornix separated it from the vaginal canal. The only difficulty experienced in the examination was the marked tenderness over the whole uterine tumor, necessitating very gentle manipulations and making firm pressure impossible without anesthesia. This unusual sensitiveness may, therefore, also be regarded as an important factor in the differential diagnosis between uterine and ectopic gestation. In all cases the uterus was considerably enlarged, the cervix softened and rather patulous as in uterine pregnancy, with some of the purplish discoloration of the vagina that is peculiar to that condition, though less pronounced than in an ordinary pregnancy. On bimanual examination the lower two-thirds of the uterus could be felt as quite distinct from the tumor, particularly with a little traction upon it with a tenaculum forceps hooked into the anterior lip of the cervix. Under anesthesia the whole fundus uteri could be palpated, excepting at the side where the cornu became blended with the fetal tumor.

While it is, therefore, usually not difficult to recognize extrauterine pregnancy when it really exists, I have in several instances been greatly puzzled by cases in which ectopic gestation had been suspected but which turned out to be a uterine pregnancy. In these cases there was a very atypical relaxation of a part of the uterus, that part which contained the fetus, while the other half was firmly contracted and hard. The uterine walls surrounding the fetus seemed to be as thin as tissue-paper so that they could not be felt at all, and fetal parts could be palpated as being immediately under the abdominal skin, just as described in the ectopic cases, while the contracted portion of the uterus gave the impression of an unimpregnated womb. If repeated examinations did not clear up the matter, I have in several cases succeeded in recognizing the true condition by gently introducing

one finger into the relaxed and dilatable cervix, pushing it up to the internal os where I was able to make out the intact amniotic sac. As no harm resulted in any of these cases from this maneuver, I can recommend it as a safe, satisfactory, and perfectly reliable means of establishing the exact diagnosis in such truly puzzling cases which have in not rare instances remained unrecognized until the abdomen was opened.

In the first case the operation was postponed until one or two weeks before the end of term, but on account of the marked deformity of the well-developed child delivery at an earlier period was thought more desirable, because by the absorption of the liquor amnii during the last months and the greater size of the fetus, compression of the latter by the surrounding structures would be more liable to cause deformities which an earlier delivery might prevent. While this supposition proved correct in the last two children delivered at seven and one-half months, this advantage was more than counterbalanced by the lack of development, general weakness and poor nutrition shown in the last two cases which have demonstrated to me that an ectopic fetus, which under the most favorable circumstances is at a great disadvantage compared with a child of uterine pregnancy, has very little chance of living when delivered prematurely. It is, therefore, unwise and very dangerous to the child in whose interest the operation is deferred at all, to deliver it much before the end of term.

It may be asked, why postpone the operation at all when the diagnosis of advanced ectopic gestation has been definitely made in view of the fact that ectopic children have so little chance of surviving their birth, while on the other hand the mother is not only kept in anxious suspense for weeks and months, but is also exposed to some danger from rupture and other complications?

Admitting that an ectopic child is illy prepared for life, and that most of them succumb shortly after birth, yet some of them have reached the adolescent period, one at the last report being nineteen and one-half years old. Of one hundred and twenty-two cases collected by Sittner, sixty-three survived the first month. It seems to me, therefore, that the child has some right in this condition, provided that the mother's life is not unduly jeopardized by the delay. The greatest danger to the mother is undoubtedly from a secondary rupture of the sac. That this, however, is comparatively rare is shown in Sittner's statistics

who is authority for the statement that among 579 cases in the second half of ectopic pregnancy, including 179 with viable child, only in 7.4 per cent. secondary rupture occurred.

The life of the mother is, therefore, particularly when under careful and close observation as such a patient always should be, not often very seriously endangered by the delay required to obtain a living child. Neither is the operative mortality greatly increased by postponing the operation until viability of the fetus is reached. I personally at least would favor, therefore, in justice to the child postponement of delivery to as near the end of term as the safety and well-being of the mother would permit.

In all these cases the placenta was removed with the sac, completely in the last two cases, while in the first a small remnant of the sac, which was very intimately attached to the intestines, was drawn together, stitched to the abdominal incision and drained. No drainage was used in the last two cases. This brings us to the very interesting subject of the treatment of the placenta and sac. Even at the present time there is a great diversity of opinion as to the best and safest method of dealing with these important products of ectopic gestation. The placenta particularly has been the stumbling block in the treatment of this condition, and the principal reason of this has been the great danger of uncontrollable hemorrhage from these structures during operation. This fear of fatal bleeding has deterred the older surgeons from operating on cases of advanced extrauterine pregnancy until after the death of the fetus, when the placental circulation ceases and the danger of hemorrhage is considerably diminished. Even at the present day this method finds some advocates, though the number is constantly diminishing. Very recently (AMER. JOUR. OF OBST., February, 1906) Charles A. L. Reed advises to wait, if no urgent symptoms are present, until two or three months after the fetal death as by that time the placental bloodvessels are mostly obliterated. A delay beyond that period he regards as injudicious because absorption of decomposed products from the fetus might give rise to symptoms of intoxication, and advanced destruction of the soft parts might expose the patient to pains and mechanical irritation from the loosened bones.

The laudable desire to deliver a viable child has influenced surgeons, however, especially in recent years, to overcome the difficulties connected with the placenta and sac in various ways.

Some, after delivery of the child, left the placenta and sac undisturbed, sewing the latter to the abdominal walls and draining it. The result has almost invariably been sepsis and secondary hemorrhage, so that Lusk very properly said of these that "the fortunate results belong to the domain of miracles and do not invite to imitation." In view of the fact that a dead fetus with sac and placenta has often been carried in the abdomen for years without any very serious accidents, it was tried to imitate nature by leaving the placenta and sac after the delivery of the child without draining it; that is, closing the abdominal cavity completely over these structures after operation. The results, though tried in only a few cases, were not encouraging. Most of the cases became septic subsequently and in spite of reopening the abdominal cavity, proved fatal.

The only rational treatment, therefore, seems to be the entire removal of the placenta and sac whenever possible, or at least the placenta and as much of the sac as can safely be extirpated, leaving as little foreign material as possible in the abdominal cavity to invite sepsis and other disturbing elements, during the patient's convalescence. The cases in which this procedure is not possible should in my opinion be very rare, provided all necessary precautions and safeguards against that one great danger in this operation are made use of—namely, uncontrollable hemorrhage from the placenta.

The placenta derives its blood-supply mainly from the ovarian artery and its anastomosing branches of the uterine artery. If we succeed in controlling these two arteries at the onset of the operation, immediately after the delivery of the fetus no excessive hemorrhage need be feared, as was demonstrated very conclusively in my first case. The most terrific bleeding was immediately under complete control after clamping the infundibulo-pelvic ligament on one side and the vessels leading from the uterine cornu on the other. We should endeavor, therefore, to get at these important vessels as soon as possible with as little disturbance of the sac and placenta as practical. Unfortunately these arteries are not always easily accessible as I learned in my second case. The fetal tumor completely blocked the pelvis above the uterus, so that the latter could be located only after extensive dissection and separation of the sac. I was greatly hampered by the frightful hemorrhage from the placenta when brought into close contact with the latter. It is, therefore, not always possible to secure these arteries in time

to prevent hemorrhage and possibly to save the patient, and in such cases compression of the abdominal aorta is the only means we possess to control this truly alarming bleeding. This was resorted to in my second case, but unfortunately not until the patient had lost a large quantity of blood. To anticipate this accident I should, therefore, in the future, at least in all such cases where the ovarian and uterine arteries cannot be reached very promptly, use compression of the aorta as a prophylactic as soon as the delivery of the fetus is accomplished.

As digital compression is not entirely satisfactory for various reasons, some other mechanical means should be substituted which effects compression of a wide section of the aorta, the object being temporary occlusion of the artery without injury to its walls or lumen. Surgeons have been experimenting in this line for the treatment of abdominal aneurysms, and Halstead (The Result of Complete and Incomplete Occlusion of the Abdominal and Thoracic Aorta by Metal Bands, *Journal of the American Medical Association*, December 29, 1906) has devised a metal band which can be left on the aorta for hours, even days, without damaging its coats in the least. This he has demonstrated by numerous experiments on dogs and in a few instances has applied this method also on the human subject. He, as well as others, has demonstrated that such compression can be kept up for hours with safety and without fearing serious complications. There is, therefore, no reason why it should not be adopted as a means to control the bleeding and prevent the disastrous hemorrhage so much dreaded in dealing with the placenta in these cases.

My plan of procedure in advanced ectopic gestation, especially when the sac fills up the pelvis and when it is impossible to gain early access to the uterus and the ovarian and uterine arteries, would be to begin by exposing the abdominal aorta, encircling it by means of Halstead's metal band or an ordinary broad clamp whose branches have been protected by rubber tubing, such as an intestinal clamp. This should, however, not be tightened until after the delivery of the child, as too early occlusion of the vessel might jeopardize the life of the fetus by prematurely cutting off its blood-supply. The complete extirpation of sac and placenta could now be effected without undue haste and without fear of hemorrhage. Even those cases in which a part of the placenta has become engrafted upon loops of intestines should not necessarily decide us against completing the radical operation, because resection of the damaged intestine

whenever such should be required, could be resorted to, as was done by McDonald in a similar case.

Having, as I firmly believe, in the prophylactic instrumental compression of the abdominal aorta a safe and reliable means to prevent the so much dreaded placental hemorrhage, which has really been the principal stumbling-block in the surgical treatment of advanced ectopic gestation, there seems to be no longer any just ground against the radical operation in this condition, consisting in the complete extirpation of the gestation sac with living placenta, an operation which, in my opinion, is the only proper and correct surgical procedure for these cases.

SOME EXPERIENCES WITH EXTRAUTERINE PREGNANCY AND REPORT OF CASES.

BY

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THE importance of this subject, together with its very frequent occurrence and the now universally accepted surgical treatment of the condition, has prompted me to write this paper, in which I shall try to deal briefly and practically, with a few phases of the question and give the conclusions which have been forced upon me as a result of an experience with seventy-three cases, in all stages of development, and perhaps with all possible complications and difficulties. After studying my records, they may be conveniently grouped into certain distinct and separate classes.

First.—Those in which rupture had not taken place.

Second.—Those in which sudden rupture occurred and a large vessel was opened, or a tubal abortion in which the bleeding continued freely into the peritoneal cavity, and where there was no tendency to localization of the hemorrhage or the formation of a hematocele—the so-called tragic or cataclysmic cases.

Third.—Cases in which rupture, partial or complete, had taken place—including tubal abortion, partial and complete—and where upon operation a large pelvic hematocele, more or less completely encysted, existed and where the ovum was so small that it either escaped observation or it was broken down in the blood-clots which were in the sac contents. In this group can also be included those cases where the rupture took place on the under surface of the tube and the blood escaped into the folds of the broad ligament, producing a broad ligament hematocele which, in my experience, is a rare variety and cannot often be diagnosticated until the abdomen is opened.

Fourth.—A group where rupture took place, but where the ovum continued to grow, say up to the fourth or fifth month, either within the peritoneal cavity or between the folds of the broad ligament, because it was not completely detached at the time of rupture, or because it made a new placental attachment.

Fifth.—A class where the conception product broke down more or less completely and formed a pelvic abscess, or where its contents—pus, bones and débris—were being discharged either through the vagina, rectum, bladder or abdominal wall.

Sixth.—Where the fetus went on developing until it was viable or to term, and was then delivered by operation; or it died during labor and was finally removed as a lithopedion or other degenerated product.

Any form of pregnancy outside of the uterus is termed extra-uterine, and so far as we are interested, clinically, anatomical distinctions are of little value; because it matters not whether the condition be one of tubal abortion or rupture in any part of the tube or cornu, the symptoms are practically the same and their relief must usually be brought about by surgical intervention.

The diagnosis of ectopic pregnancy before rupture takes place is seldom made because the cases do not come under observation early enough, and usually when a specimen is obtained early, it is because an operation was undertaken for some other condition, or where a tentative diagnosis was made with merely a suspicion of tubal pregnancy, because a slightly distended tube, whether by serum, blood or pus or an aberrant ovum, may give the same objective and subjective symptomatology. However, any tense, elastic and painful swelling of the tube, particularly when the swelling is confined to one side, and with a uterus reasonably movable, should always make the surgeon suspicious, especially if the period has been delayed, or if there has been present some irregular bleeding from the uterus. Pus in a tube, especially if slow in development, is usually associated with considerable exudate, and therefore, more adhesions exist than are generally present with an early extrauterine pregnancy. Hydrosalpinx, in my experience, is comparatively rare, and hematoceles of the tube are most often the result of a slightly or completely detached extrauterine ovum, hence we are justified in making this general statement—that any tense, elastic and painful swelling of the tube may be, and often is, an early extrauterine fetation, and should be most carefully watched, as an operation may become necessary at any moment.

In the examination of these women much care must be exercised, as the sac often ruptures as a result of the manipulations. This accident occurred to me once in one of my patients, whom I was examining in my office. She came, complaining of severe

pain in the left side which made walking painful. During the examination I felt a painful, tense tumor in the left ovarian region, and while I was performing bimanual palpation, she was suddenly seized with an acute cramp-like pain; was nauseated and became faint. I removed her at once to the German Hospital, and opened her abdomen, which contained a large amount of free, red fluid blood. The left tube had a rough, irregular tear near the fimbriated end, from which blood was flowing very freely. The ovum had escaped into the peritoneal cavity. The patient made a very rapid and excellent recovery.

A second patient, who may be placed in either the first or second groups, I saw in consultation with Dr. Gibson to whom I referred the case, and as the history is exceedingly interesting though a very common one, I shall give it briefly.

Mrs. W., aged twenty-five, married two and one-half years; a fine, healthy English woman who had always been well and regular but at the last period flowed rather profusely. She sent for a neighboring young doctor, who thought she had a miscarriage, and proceeded at once to curet her, which he did without an anesthetic. Two days after this so-called curetment I saw her, and upon vaginal examination, discovered a small globular swelling in the left side, tense and painful. The uterus was tender, and pain was elicited upon gentle manipulation. I enjoined rest; applied poultices, and gave a little codeia to relieve the pain. She had a temperature of 100°. Upon the following day I saw her again, and turned the case over to Dr. Gibson, directing him to pay particular attention to a possible extrauterine fetation. As there was still some temperature I felt that a few days should be taken to eliminate the swollen tube as a result of infection from the traumatism consequent upon the curettage. Dr. Gibson reported that the patient was doing well, and that the husband had requested him to discontinue his visits, as he thought them unnecessary.

Four weeks after my first visit I was again called to the patient's house, as she was suffering great pain and had been in much distress for some days previous. Upon examination it was at once plainly evident that she was suffering from a large encysted hematocele, the result of a ruptured tubal pregnancy. I removed her to the German Hospital, and under chloroform, opened the culdesac and let out over a pint of black blood and blood-clots of various sizes. The cavity was thoroughly irrigated with salt solution, and a piece of gauze was lightly packed into

the vaginal cut for drainage. She did well for one week, the temperature remaining normal, and then she began to complain of a good deal of pain, there being a constant elevation of temperature of a couple of degrees. On January 12 I opened her abdomen and removed a large stinking mass, which was a ruptured tube with more or less organized broken-down blood-clot. A gauze drain was placed low in the pelvis. She reacted nicely and did well, and on the thirteenth day, with normal temperature and normal pulse and bowels moving freely and good appetite, I left her in the care of one of my hospital associates, and took a trip East.

On the seventeenth day trouble was noticed with her bowels, it being impossible to move them with gentle purgatives and injections, and she was always suffering from cramp-like pains, but gas was still passing. I returned home February 3 and found her in a bad condition, crying with pain and much distended by gas, although a little gas occasionally passed naturally, but always with great pain. The bowels had not moved in six days, but there was no vomiting. I placed her at once upon the operating table, as it was evident a partial obstruction was rapidly becoming a complete one, and under chloroform anesthesia I reopened the abdominal wound and released a number of adhesions, separating and uncoiling a bad angle which existed in the pelvic sigmoid, and quickly closed the abdominal incision. She bore the operation well, and the bowels moved on the second day; she continued to do nicely, and made a most satisfactory recovery, and she is now a fine, strong, handsome young woman.

If we review this case, we should see that outside of the obstruction of the bowels, the history is quite common, and my notes record many cases which were mistaken for a miscarriage and were curetted by the attendant before the diagnosis of extra-uterine pregnancy had been made. No doubt the slight temperature which existed and especially the pain upon examination, which I observed at my first visit, was increased by the curettage, but I felt positive that the swelling of the tube was a tubal fetation. However, she got better for a short time, and then no doubt a slight rupture of the tube took place, or the trophoblasts had bored and eaten their way through the tube-wall and made small openings which permitted slight hemorrhages; these increased in amount and frequency until a large encysted hematocele resulted.

The second element of interest and of most importance to us, and what I trust this paper will provoke a good discussion upon,

is what kind of surgery shall be employed and where shall the attack be made? There is not any question in my mind that free vaginal incision will cure many of these early cases, but I believe it is only good practice when the hematocele is recent, the blood not too strongly organized in the sac, and where there is no fetal product to be disposed of. If the condition has existed some time and the blood has become organized into more or less indissoluble bands, as this case of mine was, it is a better practice to do a combined operation at the one sitting. First, incise the culdesac and empty out the sac contents, irrigate thoroughly and then open the abdomen and remove the whole mass. By first emptying the sac through the vagina, its walls collapse more or less; the bowel adhesions are more easily separated and the dangers of breaking the cyst-wall and soiling the peritoneal cavity are reduced to a minimum. Vaginal drainage alone, when the case is not recent, implies a long convalescence, often a long run of fever, and for weeks a very dangerously sick women, and often in the end a second operation to remove the unabsorbed mass with necessarily a high mortality.

In the second group, or tragic class, as Vineberg in a recent paper in the *Medical Record* discusses, are among the most terrible pictures the surgeon is called upon to care for. The symptoms are so sudden and terrific that a mistake in diagnosis should very rarely be made by any medical man with any experience. Some men have recently advocated a waiting policy, but I am not persuaded that it is good practice. On the contrary, in my view, an operation should be performed at once, and salt solution should be slowly and continuously injected into each breast throughout the whole operation, and to this solution adrenaline can often advantageously be added. One can never tell how much blood has been poured into the abdominal cavity, as pulse, hemoglobin count, or any other recent scientific deduction gives us practically no assistance. I have operated upon patients cold and pulseless, and have been surprised to see the pulse immediately come up as soon as the abdominal cavity was opened and the intraabdominal pressure relieved by the terrific gush of blood which came through the incision. The broken tube must be quickly found, and a clamp forceps applied and tied off with the greatest dispatch, and the abdomen closed with a few through-and-through silkworm sutures.

The operating room should be very warm, and, if possible, the patient should lie on an electrically heated table, or any device

that will keep up the body temperature should be continuously employed. Strychnia, digitalis and any recognized means of stimulation are to be used, and the patient is placed in bed, with the legs elevated. I have never had a patient in this condition die upon the table, and I cannot believe any have ever died by reason of the extra shock imposed by a rapid operation, who would not have died had no operation been performed, and the sense of well-being and comfort which comes to a surgeon who operates such a case and gets the women off of the table is, indeed, very great. To stand by and anxiously look for a favorable turn, with all of its uncertainties before an operation is undertaken, is one of the most harrowing experiences I have ever subjected myself to; and, therefore, it has been my practice to operate at once every such case, no matter what condition I found the woman in, and my percentage of recoveries has been encouraging.

As a rule, the technical difficulties of such operations are not great, as adhesions are not usually present, and no amount of diagnostic skill and acumen can foretell whether an operation will be difficult, and no tests or signs which are revealed by pulse and respiration—our usual danger signals—are of much value here, because they do not signify how much free blood exists in the peritoneal cavity, nor how much there still remains in the body bloodvessels; nor how quickly the empty abdominal bloodvessels will drink up the fluid just so soon as the intraabdominal pressure and irritation are removed. In other words, the condition of extreme shock which these women are found in is not alone due to the mere loss of blood into their own belly cavities, but to the great shock to the sympathetic centers, the result of its quick and sudden accumulation in the peritoneal cavity, and every one of us has noticed when operating on these cases, how quickly the pulse comes up and the respirations improve when the black peritoneum is opened and the first sudden escape of fluid takes place. If the above premises and deductions be true, then it seems to me we must come to an incontrovertible conclusion, that the waiting or delay policy of treating this class of cases is not good surgery. However, this, like many other surgical problems, must be solved by each surgeon according to his own light and experience, and the conditions confronting him.

The diagnosis of the third and fourth groups, where hematocele exists and a detached fetus of recognizable size, can usually be easily established if sufficient time is taken to carefully work

up the history of the case. The existence of a large swelling, the delayed or absent period, the irregular discharges of blood, pathognomonic in character, tarry, smeary and sticky, as Boldt pointed out in a recent paper, with shreds of decidual membrane, and sometimes even a perfect mould of the uterus, together with shooting pains in the rectum, and with that peculiar bearing down and forcing tenesmus seen in these cases, associated with many of the signs and symptoms of later pregnancy is a familiar clinical picture. Unfortunately, these cases are hurried to the operating table simply because a lump or tumor was felt upon vaginal examination, and a careful study of the symptoms was not systematically made. If the distended Douglas's pouch be opened, old blood or blood-clots, or even pus, will freely flow away, or a digit—or other small bone—can often be pulled out of the mass, and if through this opening the examining finger be thrust, often much other valuable information can be obtained. Sometimes in these more advanced pregnancies, as has happened in a recent case with me, no fluid escaped through the culdesac incision; it was all absorbed and only the fetal and placental product remained. I successfully removed from this woman a four months' fetus which was dead and had partly undergone intrauterine, or better, intraperitoneal maceration, and yet the sac contained very little fluid contents.

The treatment of this group of cases I have already detailed, and I am sure my past five years' experience with the combined vaginal opening and copious irrigation, and then an immediate abdominal section, has lessened my previous mortality materially.

The fifth group simply presented the symptoms of pus in the pelvis, or pelvic abscess, and the history of a possible association with an extrauterine product was often not thought of. The long and painful illness, with the presence of a large and tender tumor, and the usual constitutional and local evidences of pus made an operation imperative. In these cases it is also my practice to first evacuate the pus, if it can be reached through Douglas's pouch, irrigate and then proceed at once to remove the remaining pathology by abdominal section, and drain below through the vagina with gauze or tube, together with properly placed gauze drains above, according to the indications of the case. If there exists above a dirty infected area of considerable size, I usually place a gauze wick or nest in each iliac fossa. removing them on the third to the sixth day.

I have never met an extrauterine fetation that has gone on living to term, nor have I operated upon such a case where a living baby existed; but I read at our last meeting, in Detroit, a paper which dealt with the most interesting case of a lithopedion which I successfully removed from a woman sixty-seven years of age, and which had existed for thirty-two years. And that paper, with photographs, was printed in the December number, 1907, of the AMER. JOUR. OF OBST., is now preserved in the Pathological Museum of the Medical Department of the University of Buffalo.

ECTOPIC GESTATION.

BY

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SINCE 1883, when Tait taught the profession that tubal pregnancy was a condition to be dealt with by surgery, it has been generally believed that every case must be operated on as soon as the diagnosis is made. This has led many conscientious practitioners, with little experience in abdominal surgery, to operate under the most unfavorable circumstances, and while doubtless many lives have been saved in this way, it is probable that many more have been sacrificed. For occasional operators, in fact all operators, are more prone to report their successes than their failures. A perusal of current medical literature does not, therefore, give an accurate idea of the true mortality attending the surgical treatment of this physiological accident.

Recently, F. F. Simpson, of Pittsburg, and Hunter Robb, of Cleveland, have in two papers each called attention to the fact that some of these cases can with benefit to themselves wait for an operation until they have recovered from the shock produced by the profuse hemorrhage attending it. It seems to me that both of these gentlemen prove their contention by the cases they report, but Dr. Simpson, by quoting authorities to prove that immediate death rarely follows hemorrhage from other internal organs—lungs, stomach, intestines, etc.—is giving the impression that fewer patients bleed to death from tubal pregnancy than really do. And Dr. Robb by his experiments on dogs which consisted in cutting the ovarian and uterine artery and leaving them unligated, gives the same impression, if we accept his experiments as he evidently does. To me the experiment only proves that dogs do not bleed to death as readily as human beings, for we all know that his experiments could not be duplicated on women with the same results.

That some cases do bleed to death from tubal abortion or rupture is too well known to require extensive argument. One has only to refer to the literature prior to the eighties to find numerous well-authenticated cases recorded. Under a year ago I

was summoned less than fifty miles in the country to operate on a case diagnosticated by the physician as tubal pregnancy, which had ruptured a few hours previously. I went on the first train and the physician met me at the depot only to tell me that the patient was dead. There was no postmortem to prove the diagnosis, but my experience has taught me, that when a general practitioner makes a diagnosis of ruptured tubal pregnancy, it exists, and the doctor's account of the symptoms in this case left no doubt in my mind as to the accuracy of his diagnosis.

Most of the cases of death from tubal pregnancy which are investigated by the coroners, are those in which an attempt at criminal abortion has been made, and as a result an infection has taken place which was the immediate cause of death. Dr. O. P. Coe, deputy coroner of Hamilton County, gave me the record of the following cases which have recently come under his notice.

CASE I.—Mrs. M. had thought herself three months pregnant and an attempt at abortion by dilatation of the cervix had been made but produced no symptoms. Two weeks later she had symptoms of hemorrhage and collapse. She rallied and at the end of four days was in good condition. On the fifth day there was a recurrence of symptoms and she died in about three hours after their onset. A postmortem showed a ruptured tube and an abdomen filled with blood.

CASE II.—Miss, age 28, was living in a rooming house. She complained to her neighbors for several days of pain in the lower abdomen. One morning the landlady heard her pounding on the wall of her room and went in to find her in collapse. A physician was summoned who found her pulse 140, temperature 96, respiration 50. He gave her no treatment and in six hours she was dead. Postmortem showed a large amount of blood in the abdomen with rupture of left tube.

It may, therefore, be considered as proven that a certain percentage of cases will bleed to death, unless the surgeon arrests the hemorrhage. What that percentage is, cannot at the present time be stated. There are certainly no valid reasons for assuming, that it is so small as to be a negligible quantity. Any man whose experience has been broad and has not encountered such a case must be considered fortunate. If it is conceded that a considerable number of cases can be more safely operated some hours, days, or weeks after rupture has occurred, than while they are suffering from the shock due to this accident, but that some will die from hemorrhage if operation be delayed, then it is

our duty to try to determine what is best for each individual case and treat it accordingly.

For our purpose cases of tubal pregnancy may be divided into five classes. First, those in which a slight hemorrhage occurs at an early period—six to eight weeks—and kills the ovum. Such an ovum with the blood-clot may be absorbed and the patient regain her health. I have long believed that a large number of such cases occur and are never recognized by a physician. The following case represents this class.

Mrs. H., married, mother of one child four years old. Came to my office complaining of pain in lower abdomen and rectum and irregularity in menstruation. A physical examination disclosed a small sensitive mass behind and to the right of the uterus, which I diagnosticated as tubal pregnancy and wrote a letter to her father, who in a physician, urging early operation. I did not see her for two weeks when she returned for operation. Examination showed no apparent increase in size of mass, menstruation was still absent and the uterus enlarged. I operated on her at the Good Samaritan Hospital April 16, and found a rupture of the right tube, with an old firm clot plugging the opening. There was an intrauterine pregnancy of probably eight weeks' duration. The tube and ovary were removed and it was evident that the ovum in the tube had ceased to grow some time before. The intrauterine pregnancy was not interrupted and is apparently progressing normally.

In the second class, embracing those in which the rupture occurs a little later than eight to ten weeks, the hemorrhage is so profuse as to cause well-marked classic symptoms, but is not so profuse as to at once menace the life of the patient. In these cases it is not a matter of very great importance whether the patient be operated on at once or be allowed to wait a short time. Few will die in the hands of a skilled man regardless of the course he chooses to follow. There is no reason for the inexperienced hastening to open the abdomen, lest his patient bleed to death. There is always time to secure the assistance of a man skilled in abdominal surgery. Such a patient can also with safety be transferred a reasonable distance to a hospital, where the surgeon is accustomed to work in order that the operation may be done as well as he is capable of doing it. Such a patient should be kept in the recumbent position and no unnecessary examinations of the pelvic organs made. It is seldom that operation in such a case should be deferred more than forty-eight hours, for there is

no certainty that the life of the ovum has been destroyed, and another and severer hemorrhage may occur at any time after the blood-pressure approximates the normal. The following case operated on for Dr. Gillespie is a typical representive of a number of such cases I have seen.

Mrs. H., had for four months before the present illness been delivered of a six months' macerated child, that being her ninth pregnancy. I saw her during the third attack of sharp pain followed by symptoms of shock, which she had had in six days. The second attack had been so severe that she dropped on the street while returning from the grocery store. In both attacks she showed evidence of shock, but her pulse was below 60 and full. Dr. Gillespie had suspected tubal pregnancy and I confirmed his diagnosis, but we could not make a satisfactory physical examination on account of her being extremely fleshy. She was sent to the Good Samaritan Hospital for operation and under an anesthetic the physical signs manifested made us sure of our diagnosis. The abdomen was opened, a large quantity of blood was found and an active hemorrhage taking place from a ruptured tube. The hemorrhage was no doubt set up afresh by our examination under anesthesia. The tube, ovary and the fetus estimated at ten weeks were removed and the patient made a prompt recovery.

To the third class of cases belong those which are in immediate danger of death from hemorrhage. This class is not numerous, but it gives rise to practically all the arguments, as to the relative virtues of immediate and deferred operations. In the light of our present knowledge, I think it can be said that for the average operator, the best course to pursue in the treatment of these cases is to operate at once, if the hemorrhage is in progress when he sees the case, and to defer operation if it has ceased.

It will be said that no one can tell if it has ceased or not. This is true sometimes, but rarely. In the majority of cases a man can form as positive an opinion upon this point as he can upon other conditions, where he must rely upon the history of the case and the symptoms presented. I quote three cases to illustrate this point.

Mrs. A. was seen in consultation with Dr. E. O. Smith, about eight hours after rupture of tubal pregnancy. Her skin and mucous membranes were blanched, pulse so rapid and thready it could scarcely be counted, abdomen distended, respiration sighing, temperature subnormal. Dr. Smith thought her pulse and respi-

ration slightly better than two hours previously. We agreed that her interests would be best served by delay. After three weeks had elapsed she was thought to be in condition for operation, and was removed to the Good Samaritan Hospital, where Dr. Smith operated on her and she made an excellent recovery.

CASE III.—Mrs. —— was admitted to Christ's Hospital complaining of vesical and rectal symptoms and with a small movable tumor in the lower abdomen. When I saw her she had been anesthetized by one of my colleagues for the purpose of examination. I joined in the examination, but the mobility of the tumor misled me and I diagnosticated a small solid tumor of the ovary.

I left the hospital immediately but in a few hours was urged to hasten back as the patient was said to be dying. When I reached the bedside her condition was most alarming and all those present believed she had been kept alive by salt water, which had been given intravenously. I opened the abdomen at once and found it filled with blood, a very active hemorrhage being still in progress from a tubal abortion. There was no doubt in the mind of anyone present that she would have died had not surgical aid been so promptly rendered.

Mrs. S., age 25, married six months, was living with her husband at a private hotel in Cincinnati. She was under the care of Dr. Hocker for what seemed to be an abortion. She had passed a membrane with considerable hemorrhage and was making a satisfactory recovery. Five days after this occurrence, one morning about three o'clock, she was seized with severe pain in the lower abdomen and manifested every evidence of shock. I saw her about nine o'clock the same morning and found the lower abdomen filled with fluid, extremities cold, pulse weak and thready, respiration sighing, temperature subnormal. She had had morphia hypodermically. Dr. Hocker told me she considered her condition better than an hour or two previously. I, therefore, after observing her for half an hour advised that operation be deferred. She was kept perfectly quiet under the care of a good nurse. In about five days her condition was sufficiently favorable to justily operating, which was done at Christ's Hospital, June 25, 1908. The abdomen was filled with blood. The tube which was ruptured in two places was removed. She made an excellent recovery.

It will be seen that my judgment was correct in two of these cases in which I advised delay. They could not have done better

from an immediate operation and it was, and still is, my opinion that the slightest additional shock produced by the most expeditious operating would have proven fatal in both cases. My reasons for thinking the hemorrhage had ceased were, the number of hours that had elapsed since the onset of the symptoms and the testimony of my consultant in each case that the patient showed slight improvement. In the other case I had every reason to believe the hemorrhage still active and the patient was already in the hospital where operation could be made without delay. I have had numerous other cases, similar to these which go to prove my contention, that it is often possible to determine whether or not the hemorrhage has ceased. I believe if five or six hours have elapsed since the rupture, and the patient without the absorption of salt water has not lost ground in the last hour, it is safe to assume that the hemorrhage has ceased.

My experience during the last ten years, in which I have done no family practice, has been in almost every case, when I first saw the patient the hemorrhage had ceased. I presume that this is the experience of every one who sees these cases only as a consultant, for in the majority of cases by the time the family physician has responded to his summons, recognized the condition and got his consultant to the house, time enough has elapsed for the hemorrhage to either cease or destroy the patient.

It is always stated by one or more persons taking part in the discussion of this object, that there is great danger of another hemorrhage as soon as the blood-pressure is restored to something near normal. This is true in cases of slight hemorrhage, but not in the grave ones. At least it has not been my experience, nor has it been the experience of Robb or Simpson according to the report of their cases nor should *a priori* reasoning lead us to expect it, if the patient is properly treated.

The great loss of blood decidedly increases the coagulability of the blood-stream favoring the formation of a firm clot. It will be days rather than hours before the blood-pressure approaches the normal if it be not raised by injudicious stimulation, so there is little danger of the clot being forced out by the blood-stream. Such a profuse hemorrhage is usually fatal to the ovum, so there is not likely to be another rupture. In case it is decided to defer operation, the care of the patient is exceedingly important. For the first twenty-four hours she should not be allowed to move, the catheter being used to evacuate the bladder and

morphia enough given to quiet the nervous system and to make the dorsal position endurable. Stimulants are not necessary and should for the most part be withheld. Nothing is more irrational than to give salt water in the vein unless the bleeding-point has been secured. A limited amount of it may be used in these cases by rectum or under the skin. In a few hours the peritoneum will begin to absorb the fluid constitutents of the blood. This is the best possible way to supply the system with that which it most needs.

I know of no other class of patients that recover so rapidly from the loss of a large quantity of blood. The stomach should be kept empty for several hours, then a limited amount of hot fluid may be given. Vomiting might prove fatal by disturbing the clot. Last winter a patient of mine at the Cincinnati Hospital ruptured a tubal pregnancy by a slight struggle incident to taking the anesthetic for operation. After forty-eight hours the stomach can be trusted to take care of a generous amount of easily digested food. It is not necessary or desirable for the bowels to move for several days, but when they do, they should be assisted by a gentle laxative. Either straining at stool or the use of an enema would be dangerous. Most of these cases will will be ready for operation in from five to fifteen days and operation should be done as soon as the patient's condition makes her a good surgical risk.

In the fourth class, there is a living fetus, which has developed to the sixteenth week or later. About fifteen years ago I operated on a case at the sixth month in the Good Samaritan Hospital. The child died in a few minutes and the mother only survived twenty-four hours. Her death was due to loss of blood occasioned by the separation of the placenta from the intestines and omentum, to which a large part of it was attached. It is generally conceded that the life of the child should not be considered if the diagnosis is made before it is viable.

At Christ's Hospital I operated on Mrs. ——, who was at full term and having labor pains. I removed her uterus along with the gestation sac, which contained a living child. The upper part of the head protruded from the fimbriated end of the tube which apparently had not ruptured and which contained all the rest of the child and the placenta. The end of the tube made a constriction around the child's head which was still noticeable the last time I saw it. I exhibited this mother and child to this association at the Cincinnati meeting, two years ago. The child

is still living and well. It is about normal in size and possesses a normal amount of intelligence.

In the fifth class we have to deal with the dead fetus, which has attained an advanced stage of development. The death of the fetus renders the operation safer for the mother providing it be not undertaken until a sufficient time has elapsed for change to take place in the placenta. I have operated on two such cases, the first at Christ's Hospital a number of years ago. The patient was fifty years old and had a large fibroid tumor of the uterus and a mass on either side. One proved to be a dermoid tumor of the ovary, the other a sac containing all the bones of a fully developed fetus. After the patient's recovery, she gave me a good history of an extrauterine pregnancy, ending in false labor, her medical attendant having waited several hours to deliver her. This had occurred seventeen years prior to the time of my operation.

July 19, 1906, at Christ's Hospital I operated on Mrs. F. She was thirty years old, the mother of one child three years old. In August, 1905, she had missed her menstruation and had all the symptoms of pregnancy. In November, there was some bloody discharge from the uterus accompanied by severe pain. After this she noticed enlargement of the abdomen mainly, on the right side. She felt movements at about the fifth month. These movements were attended with an unusual amount of pain. The abdomen remained tender during pregnancy. At the end of nine months there were severe labor pains which lasted about twenty-four hours. After this the movements of the child ceased. The uterus was removed along with a gestation sac containing a fully developed child. She made a prompt recovery. The operation in this case, as well as the one in which the child was living, was greatly facilitated by removing the uterus with the sac.

DISCUSSION ON THE PAPERS OF DRS. WERDER, HAYD, AND BONIFIELD.

DR. ALBERT GOLDSPOHN, Chicago.—I do not think it is right to assume that all cases of extrauterine pregnancy should be operated on at once, the same as we would treat a case of appendicitis. That, I understand, was the position taken by Dr. Hayd. There are extremes in connection with this subject just as the pathology would suggest. Very many are not tubal ruptures, but tubal abortions, the ovum simply slipping out of a somewhat dilated abdominal end of the tube. Such cases usually do not bleed very long, nor do they bleed very much,

nor do they produce any profound shock. Their natural course is for the hemorrhage to stop, to form a hematoma to a limited degree, and there is no immediate or remote danger to life. Operation is usually advised in these cases because invalidism would result more or less from this cicatricial mass of coagulated blood which would not be entirely absorbed, would usually fo m a coagulated entanglement about the ovary—a disease which would require operation later anyhow.

This form of trouble is comparatively so simple that it can oftentimes be attended to by vaginal section alone. When we know the hemorrhage has stopped and the hematoma is accessible, it can be emptied by the vagina, if we make the proper incision for vaginal drainage. That much is certainly true in regard to tubal abortions, and the declaration made by the great and lamented Saenger before the Medical Congress in Rome, that so-called hematoceles are usually, and as a rule, simple tubal abortions, I think pretty nearly correct. On the other hand, it is not safe to assume that all ruptured tubal pregnancies are going to stop bleeding, but that they do sometimes produce death. I observed two such cases some twenty years ago, when surgery had not advanced to the state that it is in at present and the proposition to operate was not so readily met, and in these cases was not accepted. Death followed, and autopsy proved the result. Death occurred inside of twelve hours in one case, and in twenty-four hours in another. But these cases of ordinary tubal rupture that will not stop bleeding are not the majority, because many of them do stop bleeding. The abortions practically all stop bleeding, and a good share of the tubal ruptures also stop bleeding under rational rest treatment. Therefore, the proposition to operate at once always is certainly out of order.

As Dr. Bonifield has stated, we can in many cases feel our way and come to a pretty good conviction that hemorrhage has stopped, and then can let the patient wait, be transported to the proper place, put into the hands of a competent operator, who cannot only take care of this one accident, but of everything else the woman needs in her abdomen, much more than would have been done if anyone had opened the abdomen as an emergency case.

Dr. C. C. Frederick, Buffalo.—A week ago this afternoon I did my one hundred and thirty-third operation for ectopic pregnancy. I took part in a discussion at the Philadelphia meeting of the American Gynecological Society, held in May last, upon a symposium on this subject, where Dr. Robb, of Cleveland, laid down the question of immediate *versus* deferred operation for ruptured tubal pregnancy. At that time I reported a hundred and twenty-five cases of ruptured tubal pregnancy. I have done eight since. Six of the hundred and twenty-five cases were rapidly fatal hemorrhages. In one hundred and nineteen cases, hemorrhage had ceased and then returned, and some

of them had gone along from one to two or three weeks after rupture, two having gone, respectively, five and six months after rupture, with constantly recurring hemorrhages. I have also seen six cases of undoubted tubal rupture with a small amount of hemorrhage where we waited to see what the result would be, and these six patients got well without operation. This shows, as has been pointed out by Dr. Bonifield and Dr. Goldspohn, that there is a certain proportion of cases of tubal abortion where the amount of hemorrhage is small and ceases and the patients eventually get well.

I operated on three women with an undoubted history of tubal pregnancy five or six years before who had masses in their pelves, in which I found fetal remains that had undergone growth for two or three months apparently after rupture; eventually fetal death ensued and left a lithopedion in the pelvis. I have never seen a case go to term or approach it. I have seen two cases that went on to five or six months, with constantly recurring hemorrhages. In both of these cases the abdomen was nearly as large as that at term, with large concentric rings of blood thrown out with each succeeding hemorrhage. Both patients recovered. I recall three cases of rapid hemorrhage operated on within twenty-four hours from the time of rupture, and all died. After operating on those, I decided that in the next case I would wait. I saw a fourth case eight hours after rupture. This woman was pale, anemic, abdomen full of blood, sighing respiration, pulse 140 to 150, small and flickering; low hemoglobin index. I stimulated her to the utmost. I sat by her side for five hours to see if she would not rally so that I could operate, as I thought if I operated at once she might die on the operating table. At the postmortem I found the abdomen full of blood. The next two cases of rapid hemorrhage I operated on I saved; therefore, I am well convinced that in these cases of rapid hemorrhage, where the patients do not show any signs of rallying, but show symptoms of continuous hemorrhage, we should stop the hmorrhage here just as we would stop it elsewhere. Of course, some of these patients may die; others may get well by operation.

Dr. Henry Schwarz, St. Louis.—I have enjoyed all three papers very much, and I only wish to call attention to a few points I may have possibly misunderstood. From Dr. Werder's paper it would appear as though tubal pregnancy would rarely go to term. While that is true, two of his cases were instances of primary rupture that went on after the rupture to very near term; yet it is a matter of record that tubal cases go to term. There are p'enty of such cases on record. I operated on a case February 22, 1896. The woman should have been confined December, 1895. Fetal life continued until the middle of January. I saw the woman on the 20th of February, and operated on Washington's Birthday. The sac was removed in its entirety, and when opened disclosed a mature macerated fetus, above the average weight. It was examined and found to

contain muscular fibers everywhere. It was a clear case of tubal pregnancy, having gone beyond term without any evidence of rupture.

DR. ZINKE.—Were there any adhesions?

DR. SCHWARZ.—I do not remember. I cut it out completely, and the woman made an uneventful recovery.

Another point on which I differ slightly from Dr. Werder is this: I do not conceive of any case of tubal pregnancy which has not ruptured, where we have a right to wait a day for the baby's sake, unless we have the woman in the hospital under observation, where we can interfere at any moment, if it be a case of advanced pregnancy without previous rupture. In a case of previous rupture I will grant that the chances of sudden fatal rupture are not great, but in all other cases we had better stick to the rule that any ectopic gestation which has not ruptured should be looked upon as a malignant tumor, and the sooner we remove it the better. Of course, where ectopic gestation has ruptured, our modes of procedure and our attitude toward those cases may be varied.

As regards the control of hemorrhage, in which Dr. Werder has been so very fortunate, I will say that I had a case in 1902 of a woman who had clearly a ruptured tubal pregnancy in the third month; she had all the signs of pelvic peritonitis following it. She was very sick for several months afterward. When I saw her she was twenty-six weeks pregnant. The fetal heart beat could be clearly heard in the left hypochondriac region; I operated on her, and in trying to make an incision in the median line before I reached the peritoneum there was almost uncontrollable hemorrhage The placenta was implanted in the parietal peritoneum, the tube having gradually rarefied and disappeared, so that I had a very severe hemorrhage before I could get into the abdomen. The fetus lay in the amniotic membrane, with very little amniotic fluid, and could be easily extracted, but the time lost in securing the ovarian and uterine vessels was so great that the woman did not live long after leaving the table, and died before I left the hospital.

As regards the paper of Dr. Hayd, I notice that in his argument he speaks of cases in which fetal development goes on by reason of the newer attachments formed. That is a bit of heresy we see in all text-books that deal with ectopic gestation. Of course, we know that the great bulk of all cases anyone ever sees are instances of either primary tubal pregnancies or tubal pregnancies that have ruptured and where the development goes on because the placenta remains attached to the tube at its original site, and many have maintained that so-called cases of abdominal pregnancy, cases in which there is no attachment between the ovum and the pelvic organs, and the cases of ovarian pregnancy may be instances where at an early period tubal abortion has taken place and the aborted ovum has become reattached. I refuse to accept such a supposition for the simple

reason that the cases are exceedingly rare. Those cases that we know of show no history of a previous rupture. It looks more reasonable that these are cases of ectopic gestation that are not tubal, or tubal cases with primary rupture have originally attached themselves to the site in which they are found.

Likewise I differ from my friend, Dr. Hayd, in his statement that hematoma of the broad ligament is difficult to diagnosticate. It is exceedingly rare, it is true, but it would be very unfortunate if a woman who has a tubal pregnancy should have rupture occur in this one safe space into the broad ligament, unfolding the broad ligament and filling the cellular tissue on one side, making a tumor which is self-limited. If such a woman should be subjected to a laparotomy simply because the diagnosis is difficult, it would be a mistake, because the diagnosis in reality is easy. In these cases we find a bulging tumor low down in the vagina. We do not find it in any case of ruptured tubal pregnancy, but in this rare form when we examine bimanually we have a tumor like a cellulitic abscess, a tumor situated low down, which can be easily made out.

In this connection I may report what may be considered a celebrated case that I saw on the 6th of August, 1892. I remember the date exactly, because I went to Chicago to see the case. The woman had last menstruated in May; she passed her menstrual period in June, and at the end of June, while at the Germania Club dancing, she fell on the floor with a severe piercing pain on the right side. She was taken home and treated by some of my professional friends in Chicago for a number of weeks, and was finally removed to the Michael Reese Hospital. On the 4th of August, under an anesthetic, they discovered she had ectopic gestation, and prepared for operation. I was sent to Chicago by the family to give my consent. When I saw the patient I found that she had been scrubbed with bichloride of mercury, prepared for operation, so that it was difficult to make an examination. I could simply feel a swelling. We had some argument regarding the case until one of the younger men remarked, "Well, I do not see how any man who is half qualified can be in doubt as to the exact nature of the case." Then, of course, I said men who sit in glass houses should not throw stones. You have taken three months to make a diagnosis, now I insist on examining the woman under an anesthetic, and if I find things as you say, you can go ahead and operate. The patient refused to take the anesthetic and we were asked to leave the hospital. I turned the patient over to Drs. Henrotin and Byford; we examined her and found a distinct hematoma in the right broad ligament. This hematoma was perhaps as large as a man's head. There was every reason to believe the ovum had been destroyed, and so we simply kept the woman quiet at home and gradually the hematoma disappeared. She was sent back to St. Louis in December, when this lump had gone down to the size of a lemon. The following year she

conceived, and gave natural birth to a fine, healthy offspring, so that is one of the cases in which a hematoma in the broad ligament was easy to diagnosticate.

Dr. A. B. Miller, Syracuse.—I think the subject of ectopic gestation is one that must be dealt with from the standpoint of each individual's experience. Inflammatory conditions of the pelvis have been extensively discussed from year to year before this Association, and it appears the members go away with no greater conviction as to how to deal with cases of ectopic gestation than when they came.

I have operated on over one hundred cases of ectopic pregnancy, with a mortality of 3 per cent., and of these three cases one was complicated by an umbilical hernia of long standing which became strangulated. The second case was complicated by streptococcic infection in the opposite tube, and the third was *in extremis* from hemorrhage.

The point which I desire to make regarding this condition is that the time to defer operation cannot be decided on, nor can anyone lay down any law which will guide the ordinary practitioner as to when to operate on these cases as he comes in contact with them.

My first case of ectopic pregnancy occurred twenty years ago. At that time I sat by the side of a patient, did not do very much, and she recovered. I know absolutely she was ectopic, because she had oozing of blood; she had a filled pelvis, so that there was every reason to suppose that her condition was one of ectopic pregnancy. I have since seen and known of other cases under the same conditions that got well, and still other patients who have died where the physician sat by the bedside, waited, and did not operate promptly.

I have come to look upon operating on these cases as almost sidewalk surgery. I contend that the sooner a surgeon opens the abdominal cavity in a case of ruptured ectopic pregnancy, the more certain he is of saving life. Some of the patients who have died without operation could undoubtedly have been saved if operated on immediately.

Dr. Walter B. Chase, Brooklyn.—It seems to me evolution is going on in regard to the question of the management of ectopic pregnancy. I do not believe there is a Fellow on the floor of this hall who, five or eight years ago, would have maintained that it was safe to wait in every case of ectopic pregnancy where hemorrhage was present. But I am sure the experience of Dr. Frederick and many others must be pertinent in this direction. It is a question of to do or not to do; whether to bear the evils we have or fly to others we know not of. When Dr. Frederick and others tell us that in these cases of ruptured ectopic gestation 5 or 6 per cent. only perish, those of us who have been advocating and practising that the first duty we have, when we have made a diagnosis of ectopic pregnancy in which there is evidence of hemorrhage, is to operate, why should we be in such

haste. On the other hand, we are confronted by the fact which Dr. Miller has mentioned, that in certain cases the patients die, and here is the difficulty in my experience, and I presume it will be confirmed by many others—that is, absolute diagnosis. If we could have reliable statistics from the men who have operated in cases of ectopic pregnancy because of bleeding taking place at the time of the operation, removing the clot which had partially or entirely occluded the tube, we might have some further light on the subject, and it is along that line we are going to get light. It takes more courage to sit and see a woman bleed to death than to operate. I believe every case must be considered a rule unto itself. In most cases we can determine whether hemorrhage has ceased or not. Where the attack is sudden, even in the presence of shock pronounced, I think we may be justified in operating. We never feel so well satisfied as when we are able to find the ruptured bleeding vessel in the broad ligament and ligate it.

Dr. Miles F. Porter, Fort Wayne.—If any one of you were called to see a woman or a man with a history that the patient had received a stab wound in the neck and knew from the symptoms he was bleeding to death, you would naturally as a surgeon tie the bleeding vessel. And that is the thing to do here in the presence of hemorrhage. If you can tell that the hemorrhage has stopped in a case of ruptured ectopic pregnancy, you may wait. But where is the man who can tell? We may run the risk of losing the life of the patient where he has to wait to tell, or if he is not positive it has stopped.

Another thing: Why do you wish to wait? Where tubal abortion has formed itself into an encysted hematocele, you have got cause enough to open the woman's belly in the pathology which preceded and was the occasion of the tubal pregnancy. She has a diseased tube, and the belly should be opened for that reason. In that resides my objection to the vaginal operation in all cases of tubal abortion or cornual pregnancy. Every patient with a ruptured pregnancy in a bicornuate uterus will die if we do not stop the bleeding in a hurry; and who can tell whether there is a bicornuate uterus or not, if you have not examined the woman and determined whether or not hemorrhage has ceased? If the patient's shock has gone by, why wait and do nothing in the hope that the bleeding will not recur?

It does not seem to me good logic or good surgery for one to wait and do nothing in these cases. Again, to inject into a woman's veins under these circumstances fluid is to do worse than nothing. You are doing just exactly what Nature will do if you wait long enough; that is, bring up blood pressure and thus cause another hemorrhage, if you do not operate on her. No man has any business to introduce into a woman's or man's veins fluids that will increase tension while he or she still has an open vessel.

As to an absolutely accurate diagnosis in these cases, the man who waits to make an absolute diagnosis in abdominal surgery,

as in a great many other kinds of surgery, is going to bury many patients before he reaches a diagnosis. Personally, I prefer to be saved rather than buried on a correct diagnosis. I think most of our patients prefer the same thing. The only patient I ever saw die from ruptured tubal pregnancy was one that bled to death while a physician was sitting by the side of the bed, hoping and praying that she would recover, both of them equally good remedial measures, I believe.

Dr. Thomas B. Noble, Indianapolis.—I am more than glad that I am a Hoosier after having heard the words of Dr. Porter, for I believe that we should continue to preach the doctrine of ligating an open bleeding vessel if we wish to save the lives of these women. I believe that we should do it for several reasons: First, I believe it is right. Second, if we wait, we are not waiting to avoid a laparotomy; we are not waiting with the belief that we are going to get the woman through without a difficult surgical procedure. Third, a hematoma forms and changes occur. We will observe changes in the peritoneum which at this time is more active and more responsive. I do not know of anything that changes the peritoneal coat quicker and more completely than the presence of a blood-clot, and if the patient does not receive prompt surgical attention we are likely to have what occurred in Dr. Hayd's case. Pathologic conditions spring up therefrom, and a sequential laparotomy for adhesions, possibly intestinal obstruction, as he had, become necessary. Again, I have never yet been able to tell whether bleeding in some of these cases has stopped or not. I have seen just such a case as has been reported, where there was a small opening about the size of a split pea at the horn of the uterus, the abdomen full of blood, and pain nowhere except in the right nipple. Symptoms of concealed hemorrhage were present. I am a firm believer in the doctrine, and wish to preach the philosophy of immediate operation in these cases for the further reason that if we allow the information to go out from this Association that these patients are to be treated by procrastination until the diagnosis is correctly made, we will have these cases tinkered with by general practitioners until we are called in to read a death warrant.

Dr. John A. Lyons, Chicago.—I would like to ask the essayists if, in case of collapse, exsanguination, pulselessness, and almost heart failure, they would want to operate. Would it not be better to inject salt solution, give nitroglycerin, put hot-water bottles around the patient, and follow this with strychnine, until the patient gets into such a condition that one could operate with some show of safety? I am anxious to hear what Dr. Bonifield has to say on that point in his closing remarks.

Dr. Frederick Blume, Pittsburg.—There is not a member of this Association present to-day who does not feel that hemorrhage due to a ruptured ectopic pregnancy is best controlled by ligating the bleeding vessels. The view, however, that every

case of this character must be operated on as soon as the diagnosis is made has of late undergone important changes. A number of operators have called attention to the great danger of an abdominal section on patients in collapse due to hemorrhage following ruptured tubal pregnancy. Statistics are given which show that the operative mortality in these desperate cases is large and it seems to be in the interest of the patient to postpone the operation until reaction from shock has taken place. There can be no doubt that patients sometimes revive from the shock and are saved by conservative treatment.

A few months ago I saw a patient carried into the hospital—a case of tubal abortion; death already was written on her face. She was operated upon by her physician as quick as arrangements could be made, and she died a few hours later. Such extreme cases are fortunately rare. From my own experience and from what I see and hear from other operators, I am forced to believe that the conservative treatment is to be preferred in these trying cases. A patient suffering from shock due to ruptured ectopic pregnancy should not be moved, not even sent to hospital for an immediate abdominal section with hasty and insufficient preparation. Absolute rest and judicious stimulation offer the best chances in this class of cases.

Dr. Francis Reder, Saint Louis.—The crucial point with reference to these interesting papers and discussions seems to be the hemorrhage. I have not forgotten a statement made by one of my professors in 1883, Dr. Gregory, of Saint Louis, who, in lecturing to the class, said that no human being should bleed to death for want of interference on part of the surgeon. If there was a bleeding vessel, it should be tied. The same principle is applicable, I believe, with almost equal force to cases of ruptured tubal pregnancy attended with considerable hemorrhage.

Dr. Roland E. Skeel, Cleveland.—I would like to ask Dr. Bonifield in his closing remarks to say something about the pathology of anemia. I do not find that the more hemorrhage we have in these cases, the more coagulable the blood becomes.

It seems to me, we might debate this subject for the remainder of the afternoon and arrive at only one or two conclusions, one of which would be with reference to classification of cases. I think we can classify cases of ectopic pregnancy very much as we do those of appendicitis, namely, some cases we operate upon early and some late. Outside of that, all classifications are made after we open the abdomen. We can talk about classification and operation on that basis, but we really cannot make an accurate classification until we operate.

Another thing: the man who spends two or three hours in working in the abdomen in order to cover over raw surfaces with peritoneum, who fixes the other tube, suspends the uterus, brings the sigmoid down over the raw surface, fixes the bladder, looks at the appendix, investigates the gall-bladder, and finds out

the condition of the stomach naturally is not the one who operates at once, with the patient in collapse, and his personal experience is such that he waits a while, for he operates so slowly that he must lose many of his patients. After all, it is largely a matter of personal experience. To be pointed, if those of us who are married should have a wife in collapse, we would not want a man who would sit by the bedside and consume valuable time in classifying what sort of case he had to deal with, but one with his instruments ready, who would operate just as quickly as the Lord would let him.

Dr. Charles Greene Cumston, Boston.—I have very little to say, except to remark that the general surgeon has been hard hit this morning, and I am one of them. I do not think the general surgeon would stop to make an incision in the culdesac whether there was extrauterine pregnancy or not; I think he would go in by way of the abdomen, and if the hemorrhage has stopped, well and good; the hematoma must be cleaned out, and there never was a truer remark made than that with reference to the formation of adhesions following hemorrhage in the abdomen. I have seen several cases of intestinal obstruction due to adhesions resulting from a previous intraabdominal hemorrhage, not always from extrauterine pregnancy, but from other lesions giving rise to intraabdominal hemorrhage. In these cases the clot should be taken out. I am not at all opposed to the vaginal route in operating—quite the contrary; but it happened to me on one occasion to explore a ruptured extrauterine pregnancy by the vaginal incision. I cleaned out the clot, but in twelve hours or less I was back into the hospital only to remove the tube through the abdomen, because in cleaning out the clot from below it started a hemorrhage again.

Dr. Werder (closing the discussion on his part).—As there was no discussion on my paper, I simply rise to answer one question asked by Dr. Schwarz, and that is in reference to the rarity of cases of ectopic gestation going to term. He evidently misunderstood me, as I said they were comparatively rare as shown by Sittner's statistics, who collected five hundred and seventy cases of advanced ectopic gestation.

In regard to the treatment of the child, is it justifiable to keep the mother waiting in order to try and save the child? I said distinctly in my paper it would be justifiable only if we keep the mother under close observation, if there are no serious complications, and the mother is in no immediate danger.

Just a word or two in regard to the earlier forms of ectopic gestation. A few weeks ago I asked one of my assistants to look up the number of cases of ectopic gestation having been in my care, and he found in the neighborhood of two hundred including the cases in my service at the Mercy Hospital as well as those treated at other hospitals and at their homes. Hence my experience should be sufficient to enable me to come to some decisive conclusions in regard to the proper treatment of this

class of cases. Of this number of cases, at least 80 per cent. came to the hospital with hematocele of various sizes, but with no renewal of the hemorrhage at all; they were kept there under observation usually for some time before operation was performed. On some of them, however, operation was not deemed necessary because they made such rapid improvement and had no symptoms of any kind. The hematocele showed progressive evidences of absorption, and they made good recoveries in every respect. A large majority of them were operated on because they suffered much pain and there was little or no diminution in the size of the blood tumor. In less than 20 per cent. of the two hundred cases there was either hemorrhage going on at the time they were first seen, or the hematocele continued to increase without any marked symptoms of hemorrhage; or there was a recurrence of hemorrhage after it had ceased. Some of these were operated on immediately, as soon as they could be made ready, and with good results. I have seen only two deaths in all these two hundred cases who were not operated on, showing that the mortality of this condition is not nearly as great as has been claimed.

Death occurred in one patient who lived twenty-two miles from the city. The family physician telephoned me one evening to come prepared to operate, as he thought he had a case of ectopic pregnancy. As I could not go myself, I sent my assistant. He found the patient in the midst of very poor surroundings, apparently recovering from a severe hemorrhage. He remained at her bedside for two or three hours, during which time her condition seemed to be improving. Under these circumstances, especially considering the bad surroundings and a midnight operation, he left with instructions to send the patient to the hospital next morning if in condition to do so. But the patient died during the night, evidently from a renewal of the hemorrhage.

Two or three months ago I was hurriedly called to see a case of ectopic pregnancy of very grave character. I reached the house about an hour after the onset of the symptoms. I found the patient absolutely pulseless, exsanguinated, cold, and in profound collapse. She was conscious, however, and said to me, "Doctor, please cut me open; I am dying." I knew if I opened her abdomen then and there I would have no chance of saving her life, while under proper treatment she might possibly rally, but she died in half an hour. I am sure that no surgeon could have saved her.

I do not wish to be understood that I would be in favor of waiting in all cases, because I believe in certain cases immediate operation is best, especially if I were called to a patient with favorable surroundings, when still bleeding, but in a fair condition, I would open the abdomen as rapidly as possible. But if I found her with no pulse and in profound collapse, I would feel that she had a better chance by delay, as I have seen more than one such patient get well who would surely have died had they

been subjected to operation right then. I do not agree with those who believe that every bleeding vessel in the abdomen must be tied at once, just the same as on the surface. Conditions here are entirely different and good judgment is required to know when to get into the abdomen and when to stay out. Those who rush into the abdomen just because there is bleeding, ignoring the condition of the patient and the surroundings, certainly will lose more patients than they will save, and I believe experience will bear me out in this assertion.

DR. HAYD (closing the discussion on his part).—I am very much obliged to the Fellows for the reception they gave my paper, and for the splendid discussion the papers have all received. Notwithstanding all that has been said, and acknowledging the diagnostic ability of my friends, I shall still continue to practise along the lines I have indicated because I am convinced that they do not know any more about the subject than I do. They are going to take more chances in waiting than I am in operating.

So far as the diagnosis of hematomas and hematoceles is concerned—and I use the word hematoma in the sense of a hemorrhage into cellular tissue or between the planes of muscles, and hematocele, a hemorrhage into some cavity—if it be a small hematoma of the broad ligament, it is easier to make such a diagnosis than it is of a large hematoma filling the whole pelvis or culdesac, and we will have the same difficulties in making that diagnosis as we would have in making a diagnosis of intraligamentous cyst, because, as the broad ligament spreads out, it would close up the whole culdesac. For example, take an intraligamentous cyst, often we do not know whether it is an ovarian tumor or not until we split the broad ligament. In a case in which there is doubt as to whether it be a hematoma or hematocele, I suggested making a small incision into the broad ligament, a procedure in which there is no danger and for which one even does not need to give chloroform. It often settles the question in your own mind immediately, and in a large measure the future management of the case. It is not a good thing to leave a collection of blood of any size in a cavity when there is little danger in getting the blood out. For instance, in my general surgical work, in a fracture of the patella, I have ceased to leave the joint full of blood; I open it and wash it out. It cannot do any harm, if I am careful with the use of gloves and take other precautions; and if we can get a clot of blood out of that cavity, it is a good thing to get it out of the other cavity. We all agree in the treatment of hematocele that where the accumulation is marked, where it is easy to empty the cavity, it is the best thing to do it through the culdesac. If, however, the blood has become organized; if there is with the organized blood a fetal product, get rid of the fluid elements from below, then you can use the opening for future drainage and, at the same time, open the abdomen and remove the pathology

In the treatment of these cataclysmic cases there are two sides to the question, hence there are no doubt two ways of looking at it, and that is why we have taken two sides in the discussion. But I still feel, if there is danger of hemorrhage going on, and we can tell it is going on if the condition of collapse continues, it is less dangerous to open the patient. Do not do a lot of surgery. Do not wash out the abdominal cavity, because if you do you are likely to kill a great many of these patients. Scoop out the clots, which can be done in a few seconds, and close the abdomen. Such an operation can be done under ten minutes.

Dr. Bonifield (closing the discussion).—When I read this paper, I fully expected to excite some fervid oratory. Unfortunately, however, fervid oratory does not prove very much, and, as Dr. Miller has said, most of us will go away with the opinions with which we came—opinions that are based more or less on our personal experience. There is nothing that is so satisfactory to the physician as to open the abdomen when a patient is supposed to be bleeding to death to apparently save her life. He has done something great; the family never ceases to be grateful, and if the woman dies, the Lord has taken her in spite of the surgeon's wonderful skill. It is not half so inspiring to pursue a course of masterly inactivity and allow the patient to get well or die without surgical aid. Some will say we cannot tell if the hemorrhage has ceased or not. I admit we cannot if we never try Those who know all about it, those who are so cock-sure that the only thing to do is to operate as soon as they see the patient, will never find out whether hemorrhage has topped or not. I do insist that if a man views these cases in the judicial way that Dr. Werder does, in a large percentage of cases he will be able to make a fairly accurate observation as to whether hemorrhage has ceased or not. If you will read my paper carefully when it is printed you will see that I do not advise waiting in every case. In one of my cases reported I operated at once. I have operated on a number of others immediately I simply quoted typical examples. Unfortunately, I have not an accurate history of all my cases.

One thing mentioned in my paper which led to some discussion and was an inadvertency was in reference to a case I operated on at once. In this case the patient was given intravenous injections of salt solution when bleeding without my knowledge or consent. I would not have permitted that, because nothing is more ridiculous than to pour fluid into a patient's veins when she is bleeding. The thing to do is not to stimulate these patients when they are bleeding, but wait for Nature to produce a reaction, which she will do after the hemorrhage has ceased.

Dr. Skeel asked as to the coagulability of the blood after hemorrhage in these cases. I admit the idea occurred to me as to whether the blood was more coagulable or not. I did not know. My assistant looked it up in a number of text-books and in-

formed me that Ewing sustained my contention. I was ready to believe this, because it seemed to me that the good God who made us all knew what he was about, and if be wanted hemorrhages to stop by coagulation of the blood, he would have increased the coagulability of the blood as the need for this property became urgent. And this is what He did.

I like the tone of Dr. Hayd's closing remarks. I do not expect everybody to do as I advise. I knew I was taking an unpopular side of this subject, but I believe the cases reported by Dr. Werder, Dr. Simpson, and Dr. Robb give us food for thought, and in no other condition I know of in surgery do we allow 5 per cent. of our cases to dictate our treatment for the other 95 per cent. There are those who want us to treat all these cases for fear they are going to bleed to death immediately; yet, according to reliable statistics and the experience of every man, only 5 per cent. are in imminent danger of death. I did not state the percentage in my paper, as no one can tell exactly what it is, but it is probably about 5 per cent. of cases that die. I quoted cases from the coroner's office and from my own experience that had died. I want to repeat, that in no case I have seen where there has been one of these hemorrhages, which has brought the patient to the verge of death, has there been another hemorrhage of any severity in the next three or four days.

ACUTE PANCREATITIS.

BY

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THE pancreas, notwithstanding the development of a most highly perfected technic in abdominal work, seems to have been the last organ in this cavity the diseases of which have come under the care of the surgeon for treatment; in fact, the problems in connection with the pancreas, both physiological and pathological, have yet to be worked out in their completeness. We are as yet ignorant of the precise physiological functions which the pancreas performs in the human economy. It is certain that there is an excretion which has much to do with digestion; it is equally certain that there is a secretion which, taken into the blood, has to do with tissue metabolism. That the cells composing the so-called islands of Langerhans have to do with this latter function seems to be assured, but the sum total of disturbed function resulting from lesions of the pancreas and the effect therefrom upon the general economy, there being of necessity manifestations connected with excretion and with secretion, we do not exactly know. So, also, with regard to the etiological factors which produce disease of the organ, there is still much to be learned.

From a study of the text-books upon surgery it would seem that, aside from injuries and cysts, with occasional carcinomas in this organ, there are no lesions worthy of surgical note. The memorable work of Fitz, in 1889, gave an impetus to the investigation of pancreatic diseases which is just now reaching its culmination. The reported lesions were very few until within the last few years. This fact is emphasized very strikingly by the work of Boldt in the early eighties, when he was able to collect only 140 cases of diseases of the pancreas, among which there were eleven cases of pancreatitis. We find that Korte, in 1898, was able to collect only 144 cases of inflammation of the pancreas as included in the varieties mentioned by Fitz. Studies of live pathology in connection with gall-bladder disease, as exemplified in the work of Robson, Mayo and others, show that

certain affections of the pancreas are far more common than we have been led to believe and have opened a way for the treatment of a particular class of diabetics which had heretofore been grouped with the incurables.

With these, however, I am not concerned in this paper, except to say that chronic lesions of the pancreas are more amenable to surgical treatment than are the acute, that they can possibly be more definitely recognized and that not only can the local pathology be abated, but the general symptoms, due to disturbance in the secretory function, can be done away with. This is not difficult to understand if we bear in mind the anatomic factors concerned in the production of this pathology; in fact, it is quite reasonably certain that the anatomic relationship of the secretory ducts of the biliary tract to the head of the pancreas and to the main pancreatic duct, has largely to do with, not only the etiology of chronic lesions, but practically most acute ones. And, conversely, it is asserted by Robson that this relationship is responsible for some biliary manifestations. This, my own experience, has been too limited and my observations too few in this connection, to either affirm or deny. Its importance, however, is very great, as it means the opening up of wider fields into which we may soon enter with almost certainty as to the result to be attained in a given symptom-complex.

Of acute inflammation Fitz has designated three varieties—hemorrhagic, suppurative and gangrenous. That these are primarily true inflammations, microorganismal in origin, I do not believe. We do have bacterial invasion, but it is exceedingly rare that primary microorganismal infection is the cause of the so-called acute inflammations. For this reason we do not have in other organs an analogy to the so-called pancreatic inflammations.

To me the causative factor seems to lie largely in the retro-injection theory of Korte, Halstead and Flexner, notwithstanding the reports of patent diverticula of Vater, the absence of obstruction and the few isolated cases of acute pancreatitis in which the duct of Wirsung opens into the bowel at a separate and distinct point from the common duct. These are among the problems and phases of pancreatic disease which have yet to be more completely and thoroughly elucidated. My own experience has been confined to acute cases and in each case there could be no question as to the disease being secondary to biliary pathology.

Stockton and Williams, in a recent article, place the causes of acute pancreatitis under six headings:

1. Traumatism.
2. Gallstones.
3. Infection (which seems to be given high rank by Robson and Cammidge in their recent work).
4. Causes inherent in the pancreas itself due to some perverted action of its ferments.
5. Gastroduodenal catarrh (which they think operates indirectly).
6. Arteriosclerosis, embolism and thrombosis.

If we analyze these causes we can, except in the few instances where there may have been trauma or a duodenal ulcer or arteriosclerosis, class the other causes among those of disturbance of perverted action of the pancreatic ferments induced in all probability by some chemical irritant, most likely retroinjected bile. The other causes are those which may precede an infection in any other organ and it must be admitted that, in so far as this is true, the pancreas may partake of lesions and of inflammation the counterpart of those to which other structures are liable. With acute infection comes the ferment disturbances and autodigestion and fat-splitting action peculiar thereto. A careful study of the literature shows gallstones as the common accompaniment of pancreatitis, both acute and chronic. All investigators have remarked the association of these two conditions, so that there can be no doubt, I think, of the relationship between them.

Aside from the local pathology in the gland itself, the most striking changes occur in the subperitoneal fat tissue in the form of what Basler has described as fat necrosis. Langerhans has shown that the most essential changes in so-called fat necrosis are in the cells themselves, and are due to a splitting up of the fat molecule into fatty acids and its soluble constituent, glycerin. The latter is absorbed and the acid deposited as needle crystals in the necrotic cell, which loses its nucleus. These fatty acids unite with calcium which may be demonstrated by microchemical reaction within the cell outline.

Just as jaundice is the index of obstruction to the hepatic outflow, so does fat necrosis indicate obstruction of the pancreatic duct. Unfortunately, this fat necrosis cannot be noted until the abdomen is opened and, frequently, much valuable time has been lost before this point is reached.

That diagnosis is quite difficult before operation we are aware.

The symptoms are those of acute septic peritonitis of the upper abdomen; in fact, I have known one patient operated on for intestinal obstruction peritonitis, with ensuing death, the cause, acute pancreatitis, being recognized only postmortem. Fitz's rule is worth bearing in mind, that acute pancreatitis is to be suspected when a previously healthy person or a sufferer from occasional attacks of indigestion, is suddenly seized with violent pain in the epigastrium, followed by vomiting and collapse and, in the course of twenty-four hours, by circumscribed swelling, tympanitic or resistant, with slight rise in temperature.

In my own cases the acute upper abdomen peritonitis symptoms were highly exaggerated. Pain was the predominant symptom, though Halstead has reported a case in which the patient was up walking about before the operation. There is usually a history of pre-existing digestive disturbance or of colic, or of recognized cholelithiasis, possibly with slight jaundice. In arriving at a diagnosis, this preceding history should not be ignored; in fact, I would deem the history of equal or even more importance than the mere physical examination of the patient.

The pain is violent, sudden and of a pronounced type. It has been described as more frightful than of gallstones; in fact, absolutely intolerable. It is usually felt primarily in the epigastric region; later over the abdomen generally. Vomiting may or may not accompany it. If it does, it may become frequent, regurgitant and of feculent odor, but never stercoraceous in character. Probably it is this odor which has led to the diagnosis of intestinal obstruction in some cases, and this error in diagnosis is more easily understood, as constipation is marked and may even be absolute. Constipation is a very conspicuous symptom. Tenderness in the epigastric region begins with the very onset of the trouble. Collapse is profound. Death may ensue within an hour or two after the onset of symptoms. Again, this latter symptom (collapse) may not appear until a day or two has passed. The shock is not due to hemorrhage, for this, as a rule, is not great, but is probably brought on by some interference with the sympathetic and by vasomotor paralysis. Occasionally there may be no shock at all.

The pulse and temperature are usually increased and there may be chills preceding the onset. Tympany is present and may at times be very great. Jaundice may be present at the start; as a rule, however, it does not come on until a day or two after the onset of the acute symptoms. In fulminating cases a tumor will

rarely be detected, though there is marked epigastric resistance and, if the patient lives two or three days, a swelling will be noticed and, in suppurative cases, a tumor may be made out. The stools may show fat or oil droplets. The finding of undigested muscle fiber is positive evidence of the absence of pancreatic juice. Melæna is occasionally present but, in acute cases, little can be ascertained by the study of the stool on account of the constipation.

My observation, from the three cases I have had opportunity of seeing, is that they gave no symptoms of value in connection with urinary analysis, and I was not able to get the so-called Cammidge reaction which has been described by Robson and Cammidge as so characteristic of pancreatic disease. Neither could the presence of sugar be detected in the urine, and I believe that, in acute cases, the urinary symptoms will rarely be of any value.

After several days, with the appearance of swelling, jaundice and other evidences, the diagnosis should not be of such great difficulty, but at this time the opportunity for beneficial surgical interference has probably passed.

I would attach the greatest importance to the character and location of the pain, and the impression it produced upon the patient in conjunction with the previous history and the absence of positive symptoms pointing to other disease, as most likely evidence of the onset of acute pancreatitis, though a positive diagnosis cannot be made until the abdomen has been opened.

Early operation and drainage offers the greatest hope of relief, and even with this the outlook in most cases of acute lesions must still be bad. The pancreatic excretion must be drained and if this cannot be secured by rapidly clearing out the biliary tract and draining back through its ducts and the gall-bladder, it should be effected transperitoneally through the gastrocolic omentum directly from the broken-down pancreas. Any other plan of treatment is utterly futile and the sublime helplessness thereof will be shown by a mortality of 100 per cent. To be at all effective, not only must diagnosis be made early, but surgical interference must be prompt and drainage must be complete. My own experience is limited to three cases which I will relate.

Case I.—Alice H., white, age twenty-five, married, housewife, mother of four children; admitted to the hospital, April 27, 1907. Had been in failing health for nearly a year. About six months previously she had been seized with griping pains in the upper

abdomen, with some vomiting and constipation. Diagnosis of gallstone colic was made, which was relieved by medicinal treatment. Since that time the patient has been able to attend to her household duties, but has never been entirely well, having gradually lost flesh.

On April 26, she was suddenly seized with deep-seated violent and colicky pains in the upper abdomen, soon followed by nausea and persistent vomiting, constipation, abdominal distention and meteorism. When admitted to the hospital on the following day the above symptoms were all present, with tenderness and rigidity of the upper abdomen, very slight distention, skin cold and clammy, beginning jaundice, subnormal temperature, pulse 90, respiration 36. Urinalysis showed a large quantity of bile; otherwise normal. Marked leukocytosis. Diagnosis, acute choledochus obstruction, with cholecystitis and stone was made. Two high enemata were given with no results. Following a third one, a black, offensive fluid, containing hard white scybala, was passed. On April 28, abdominal distention was increased, vomiting still persistent (brownish, offensive fluid); jaundice markedly increased, temperature 97, pulse 140, respiration 60. On the morning of April 29 the patient showed some improvement.

The abdomen was then opened, incision being made in the right rectus beginning at the rib margin. The first thing noticed was extensive fat necrosis of omentum, mesentery and subperitoneal fat. The gall-bladder was enormously distended, enlarged and dark, densely adherent, and on opening it a dark, tarry bile flowed out. The adhesions were separated and when the bile tract was freed a necrotic area in the gut involving the surrounding tissue was noted and there was an escape of serum, stained and odorus in character from the renal fossa. By this time the patient was doing so badly that no attempt was made to go any further. A drainage-tube was put into the gall-bladder and another down to the necrotic area, where a cofferdam drain was placed and the incision closed. Death occurred within five hours.

The autopsy revealed those yellow-white patches, denominated fat necrosis, in the omentum mesentary and subperitoneal fat. From the gall-bladder some ten cholesterin stones, varying in size from a pin to a pea, were removed. The common duct was large and the diverticulum of Vater dilated. The liver was diminished in size while the pancreas was more than twice the normal size and showed evidence of marked inflamma-

tion with necrotic areas of small size. A hole was found in the duodenum just below the pylorus where it was in proximity to the gall-bladder when the latter was distended.

CASE II.—Mr. V. B., age forty-nine, presented at my office in shock, suffering great agony on account of excruciating pain in the abdomen. He gave a history of several attacks of pain upon previous occasions, with cramp in stomach. The last of these attacks occurred about two weeks ago. He has never had jaundice, but has been a more or less constant sufferer from indigestion. About nine o'clock on March 28, 1908, while shopping, he was seized with intense pain in the epigastric region. He was given some morphia for the relief of this pain without any effect, and a little later secured another dose of morphia. I saw him about twelve o'clock, in shock, extremities cold, nails blue, pulse thin, thready and very rapid. The epigastric region was tender to the touch. The pain was described as keen, cutting and extending to the back. The abdomen was flat. There was no tympany. Liver dulness present; no vomiting, though great nausea. At first he was thought to have a perforated ulcer of the stomach. He was sent to the infirmary, put to bed and closely watched for twenty-four hours. On the 29th, he began to show some jaundice, with excruciating pain still present in the epigastric region, some vomiting and beginning distention. Marked depression and symptoms of shock were still present. His temperature when sent to the infirmary was $102\frac{4}{5}$; pulse 120; respiration 26. Leukocystosis, 34,600, Urinalysis shows albumin, bile, sp. gr. 1020, otherwise negative. The following morning his temperature was $96\frac{4}{5}$; pulse 112; respiration 38.

Immediate operation was advised with diagnosis of probable obstructing stone. At the operation, which was at once proceeded with, there was found a small stone in the common duct; no stones in the gall-bladder. The head of the pancreas was markedly enlarged. The gall-bladder was opened and drained; the common duct incised and the stone removed. The common duct was drained by tube and gauze wick and the patient put to bed in very bad shape. He did very well for a few days, then his wound began to open, fat necrosis showing in subperitoneal fat. Pus of a dirty-brownish character presented itself. Death ensued ten days after the operation, the skin about the incision being eroded, the wound wide open. No autopsy was permitted.

Whether or not this patient had a dilated diverticulum of Vater, I do not know. A stone was present in the common duct

at the point where the duct empties into the duodenum; in fact, the stone was not within the diverticulum, the common duct passing through the head of the pancreas, and being of that type in which the presence of a stone might easily obstruct, by pressure, the duct of Wirsung and thus occlude it.

CASE III was seen June, 1908. He gave a history of digestive disturbance extending over a number of years; had been a drinker, though in the last year or two he had not used alcohol to excess. The onset of the disease was sudden and marked by excruciating pain in the epigastric region. This pain radiated into the back and into the side. There was marked tenderness upon pressure, vomiting, profound shock and obstinate constipation. Diagnosis of gallstone obstruction had been made by his physician. His temperature was 102; pulse 130. When I saw him the abdomen was distended and tender. At the middle line, about three inches below the sternal tip, was a tumor, symmetrical and extending on either side to approximately the mammary line. This tumor was hard, tympanitic on percussion, tender and painful. It formed a distinct prominence, separated from the margin of the ribs. There was a slight icteric tinge to the conjunctiva and the urine contained bile.

Immediate operation was advised and carried out with a median incision, five inches in length, over the tumor. The subperitoneal fat and the omentum were studded with areas of fat necrosis. There was bloody serum within the abdominal cavity. The intestinal coils were agglutinated and the stomach adherent, as also the upper duodenum and omentum. The gall-bladder was small and contained no stones, but a stone was present in the common duct, occupying the duodenal portion. The condition of the patient was so bad on the table that no attempt was made to remove the stone. The gall-bladder was drained. The tumor in the epigastric region was opened through the gastrocolic omentum, and from it some bloody, purulent débris evacuated. A tube-and-gauze drain was put into this cavity, which was clearly in the pancreas, and the incision partly closed. Five days later the gauze drain was removed, the bowels having begun acting and the patient taking nourishment. A week after the operation he had lost twenty pounds in weight, the skin incision and the skin about it were irritated and the line of union beginning to separate. From the tube which remained present in the cavity, aspirated fluid showed the reaction of pancreatic fluid. Belly soft, pulse 114, temperature 100° F. The mass in the epigastric

region had entirely subsided. Two weeks after the operation this patient died, the wound having opened up throughout its entire length and the margins of the skin about it being greatly eroded, probably by the action of the pancreatic juice which came in contact with it.

The urine, taken the day after the operation, showed the following: color, reddish yellow, turbid; sp. gr., 1015; reaction, acid; bile, a trace; albumin present; hyaline, granular and amyloid casts; Cammidge reaction negative; no sugar. The stools showed no fat nor blood nor muscle fiber.

DISCUSSION.

Dr. Thomas B. Noble, Indianapolis.—Acute pancreatitis or pancreatitis of any character, as we see it clinically, is further evidence for the necessity of early intervention in gallstone disease, for the reason that it so frequently follows some antecedent biliary pathology. I have had experience with three cases, two of which were hemorrhagic and one acute interstitial, all of which were attended with an antecedent biliary disease.

The first case was one of large hemorrhagic cyst due to hemorrhagic pancreatitis. The cyst was evacuated, and the patient died eight days later of acute mania. The second case was attended with empyema of the gall-bladder, with gallstones, and infection therefrom, and presented the interesting characteristics of a widespread fat necrosis. This woman made a good recovery but complained of the symptoms of the disease as given by the essayist, pain particularly in the epigastrium, with vomiting. These symptoms lasted for six days following the operation.

A third case was one of large hemorrhagic cyst in a physician. The condition had been diagnosticated as a malignant disease, and he had given himself up to die, but did not at that time. His condition continued for three or four months, which, at the time I saw him, was extreme. He could not tolerate a general anesthetic, and so, under local anesthesia, his abdomen was opened, and a gallon of thick, viscid, tarry fluid removed from the pancreatic region. His symptoms immediately improved; he did well for a week, when another hemorrhage occurred, followed by still another, and these hemorrhages recurred until he bled to death.

In the management of these hemorrhagic cases the incision, I believe, should be sufficiently large to permit packing, if necessary, for the control of a possible secondary hemorrhage that may occur from the destructive changes that the pancreatic juice has upon the bloodvessels.

Dr. Walter C. G. Kirchner, St. Louis.—I was greatly interested in the paper, as it brings up a subject which is usually

neglected, and yet it is a very important one. I do not think sufficient attention has been given to the affections of this organ, and I am almost convinced that diseases of the pancreas occur oftener than recognized. The acute symptoms of pancreatitis differ pronouncedly from the chronic, and the treatment of the chronic condition is therefore entirely different from that of the acute.

I have had occasion to see some three or four cases of acute pancreatitis; all of them died in a few days. One was an acute infection of the pancreas, with suppurative changes resulting in fat necrosis. The other was a gangrenous form; and a third case, which I saw last week, was one that gave a history of gastric hemorrhage. The patient had had several of these hemorrhages, and not thinking they were serious, the family believing that recovery would take place, very little or nothing was done. He was taken suddenly sick on the street at two o'clock in the afternoon, and an hour later, when brought to the hospital, he was in a state of collapse, and a few hours afterward was dead. Autopsy revealed a perforating duodenal ulcer, the perforation taking place into the head of the pancreas.

These conditions are of such an acute nature and so urgent that prompt surgical interference is necessary. The patient is in profound collapse, and often it is difficult to explain the condition, the pancreas usually escaping our attention. In all of these cases, as the essayist has pointed out, early operation should be done, even if it is for exploratory purposes.

Dr Porter.—Did hemorrhage occur in the case of perforating gastroduodenal ulcer?

Dr. Kirchner.—No, it was the result of infection of the pancreas.

Dr. Frank (closing the discussion).—There was one other case reported in the paper, an account of which I did not read. In the first case a diagnosis of cholelithiasis was made, an operation was performed, but no stones were found in the gall-bladder The case was recognized at once, from the condition of fat necrosis, as one of acute pancreatitis. Drainage was instituted in the gall-bladder, and also in the area about the head of the pancreas, no stones being found. The patient died two hours after operation, and at the autopsy there was a large erosion found which must have resulted from the pancreatic juice in the duodenum. Six small stones had escaped. The common duct was eroded at the point of juncture with the duodenum, and six small stones had escaped into the cavity.

In the other two cases stones were found at the operation. One case was not diagnosticated as pancreatitis until operation; while in the other case a diagnosis was made before operation was done, and one stone was found not in the intraduodenal portion, but back of it a little bit, where the duct passes through the head of the pancreas. The other case was drained through the pancreas directly. He also had only one stone.

These last two cases occurred in men. The last one, as mentioned, was diagnosticated, and at the operation a stone was found in the common duct in the duodenal portion; the common duct was drained at this point; the gall-bladder was also drained, and the pancreas was drained between the colon and the stomach, drainage being established transperitoneally at this point. The man lived two weeks; the second patient had also lived two weeks. The area about the incision in each was markedly eroded. It is a question in any of these cases that have gone on for two or three days whether anything would be of value. One interesting point is the connection between this and gall-bladder disease, another urgent reason for operation in all gall-bladder troubles as soon as diagnosticated.

ABSCESS OF GAERTNER'S CANAL.

BY

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An abscess of Gärtner's canal is such a rarity that it might almost be classified as a pathological curiosity.

So few cases have been recorded, the paucity of literature being so marked, one is strongly tempted to question the diagnosis of an abscess of Gärtner's canal.

Embryologically Gärtner's duct presents many unique stages, and the tracing of its various steps of development is interesting. The urogenital system has its beginning in the mesoderm. At a point in the mesoderm or mesoblast, where it separates into the splanchnopleura and the somatopleura there is a massing together of cells forming a ridge, known as the Wolffian ridge. This Wolffian ridge is seen to extend from just below the heart to the posterior extremity of the body-cavity. About the eighteenth day the Wolffian ridge is seen to contain a cavity; in other words, it becomes hollowed out into a tube, when it becomes known as the Wolffian duct. Just anterior to the upper part of the Wolffian duct there extends a projection into the celom, in which there are developed two or more tubular cavities emptying into the upper part of the Wolffian duct, and known as the pronephric ducts. Around these little ducts glomeruli form and then they become known as the head kidneys, primary kidneys or pronephros. So we describe the pronephros as a series of transitory tubules connected with the celom and emptying their contents into the Wolffian duct. To the inner side and behind the Wolffian duct a series of little tubes develop, which take a transverse direction and communicate at one extremity with the Wolffian duct.

To these transverse tubules the name of mesonephros or Wolffian body is applied and they sometimes are designated as the midkidney. The Wolffian body appears about the eighteenth day, but does not become hollowed out into the tubes until some time during the fourth week. As the mesonephros develops, the pronephros begins to disappear. Here and there remnants

of the pronephros remain as little pedunculated sacs, the stalked hydatid of Morgagni. It is only fair to state that there are some embryologists who say this little cystic vesicle is not developed as above described, but really comes from the anterior end of the duct of Müller.

The Wolffian body develops rapidly during the second month and is supposed to act as a functionating excretory organ, but its retrogression is equally rapid, upon development of the metanephros or permanent kidney.

The atrophied remains of these tubules as we all know can be easily demonstrated by holding up an excised broad ligament to the light. The upper part of tubules is known by names of the epoophoron, parovarium and organ of Rosenmüller, while the lower or distal part (frequently absent) is called the paroophron or the yellow body of Waldeyer.

These tubules vary in number and size and enter at right angles into the Wolffian duct.

This Wolffian duct becomes known as Gärtner's canal or duct, and much discussion has arisen as to its course, extent, permeability, termination and what significance its existence portends.

In Routh's summary, we find that Malpighi in 1681 first called attention to the greater frequency of these embryonic structures in the lower animals (as the cow) than in man, and Gärtner, in 1822, also investigated along this same line, and the Wolffian tube or duct called Gärtner's duct was named after him. Bland Sutton, in 1894, published his observations after examining some seventy cows and found persistent Gärtner's ducts.

He says that cysts may arise from Gärtner's ducts in the vagina; if so, they are usually small and contain a slightly watery mucoid material. Dilatation of the ureter sometimes appears in this locality and a suburethral abscess may simulate such a cyst. Dohrn says that kittens have persistent Gärtner's ducts along the vagina. Smith quotes R. Meyer who found Gärtner's duct as follows:

In feti 2 to 3 mo. in 12 cases, 12 times—100 per cent.
In feti 4 to 6 mo. in 21 cases, 6 times—28.5 per cent.
In feti 7 to 9 mo. in 67 cases, 11 times—16.4 per cent.
In the new-born in 18 cases, 3 times—16.3 per cent.
In uteri of adults in 54 cases, 12 times—22 per cent.

That Gärtner's duct may extend into the anterior lateral vaginal wall is now generally accepted.

Almost all of the observers who have been able to trace persistent Gärtner's ducts as far forward as the urethra, describe the opening as being just behind and to one side of the urethral orifice. It is also said to open into Skene's tubes, and to be the source of some cases of obscure albuminuria.

Shüller, Fishel, Dohrn and Rieder believe that Gärtner's ducts never persist as far forward as the urethra but to this statement most authorities disagree. Garrigues claims that in 80 per cent. of adult females these two small tubules open just posterior to the meatus urinarius. Kocks holds a similar view. Naegel says that Gärtner's duct extends as far as the vaginal portion of the cervix. Beizel and Dohrn have found it in the vagina. Ackerman says he has traced it down to the hymen. Klein has traced it in the newly born from the parovarium into the uterus down to the cervix.

Others have traced this duct into the body of uterus where it took an S-shape through the fornix and extended along the vagina. Beaudelocque traced the duct parallel to the uterine cavity to the internal os into which it opened. Also, branches of Gärtner's duct have been found to be given off into the uterine substance.

Two adult cases have been described by Lawson Tait and Milton in which the ducts discharged their contents at the vestibule just below the urinary meatus. Skene describes a case in which Gärtner's duct emptied into the urethra. In Routh's summary we find that Gärtner's ducts may have diverticula just as the vesiculæ seminales are diverticula of the vasa efferentia. These diverticula are called Max Schüller's glands and are described as leading directly into Skene's ducts and Gärtner's duct as being continuous behind and parallel to Skene's ducts.

Gärtner's duct if patent may become distended at any part of its course, constituting a variety of parovarian cyst if the distention be in the broad ligament, or a vaginal cyst if it be in the vaginal portion. He (Routh) further calls attention to some of these cases as affording possible explanations of some obscure conditions of profuse watery discharge from the vagina not coming from the uterus or bladder.

I find in literature the following interesting cases which I briefly report. In the first two reported, one by Routh and one by Kelly, a collection of pus was found in the lower part of the duct.

1. Kelly's case. The duct could be traced from close beside the cervix along the left lateral wall of the uterus to the vestibule on a level with the posterior wall of urethra. An opening occurred spontaneously, pus was discharged and this was followed by recovery.

2. Routh's case. The duct distended and contents finally suppurated. Patient 25, had attacks of bearing-down pains and coccygodynia. Improved rapidly under treatment for a while, but in a few weeks her sufferings returned.

He lost sight of patient but in two and one-half years she consulted him again for intense pain over right ovarian region and for a profuse yellow watery discharge which occasionally became horribly offensive. The abdomen was somewhat distended. Examination revealed the vulva moist from a discharge while the upper part of vagina was almost dry. Uterus was found to be movable but pushed over to the left side by a somewhat elastic mass on the side of pelvis in the broad ligament.

An elastic ridge was found in the vagina from the base of the right broad ligament to a spot slightly to the side of the cervix. A fortnight later the patient complained of a throbbing pelvic pain and her temperature had risen to 102. The ridge in the vagina was much larger and contained fluid. Under ether the tumor was distinctly felt in the broad ligament. After an opening, offensive pus continued to come away for some days. Later the duct was thoroughly laid open and much pus escaped. The opening in the broad ligament was enlarged, thoroughly flushed out, but the discharge continued for five weeks, and permanent recovery resulted. Along this line, Watt, in 1881, and Veit, in 1882, report cases associated with broad ligament and vaginal cyst.

3. Watt's patient had a vaginal cyst which bulged from the anterior wall in the position of a urethrocele.

After an incision a probe passed upward could be felt midway between the umbilicus and the left anterior spine of the ilium. He considered he had entered the abdominal cavity but it was probably between the layers of the broad ligament.

4. Veit's case was a cyst the size of a child's head protruded from the vagina. The cyst was incised and the finger could be passed up into the broad ligament and even feel the ovary.

5. Milton's case was an Egyptian woman, aged 30, who had a constant watery vaginal discharge. Married at 13, became pregnant, delivered and a healthy child; discharge continued

during the whole pregnancy. Vaginal examination disclosed a minute orifice admitting a catgut guide on the vesicovaginal septum, a little to the right of middle line and half an inch posteriorly to the vesical extremity of the urethra. From this issued drop by drop a pellucid fluid, two ounces per diem, specific gravity 1026, containing much albumin and some chloride of sodium. A urethral bougie followed the line of the ureter in the direction of the right kidney. Mr. Milton tucked the end of the canal into the bladder and closed the vesicovaginal suptum. Patient left the hospital free from vaginal discharge but with an albuminuria.

To the number I add the following report. Dr. John Caldwell asked me to see this case with a history as follows: Patient 36 years of age, normal weight 135. Married fifteen years, had never been pregnant, and when further questioned said she had never been unwell. Had never had any discharge of a bloody character from the vagina and never had had any of the other symptoms which often accompany a menstrual discharge. For some years she has had a number of very peculiar attacks, never knowing what caused them nor has she ever had any satisfactory causative explanation. They begin with a pain in the pelvic region accompanied by rigors, this being followed by distinct chills, rapid pulse and high temperature. This condition would last from a few days to a week or two, then there would be a vaginal discharge of a little pus, which was always followed by a subsidence of symptoms, and an apparent recovery would ensue. Patient would then get up, go about her household duties and be free from another spell from six months to a year, when she would be attacked by a similar sickness.

When I saw her, she explained that this was the worst attack she had ever had. She was somewhat emaciated, only weighing about 100 pounds, was very feeble, her temperature ranging from 102 to 104, and pulse 120 to 130. Upon abdominal examination some tenderness over both right and left lower sides of pelvis was discovered; vaginal examination was very painful and the patient said there had been for a few days a slight watery flow mixed with a little pus. The vagina was very hot and exquisitely tender so an unsatisfactory examination was made and on opinion given as to the trouble or causation of the same.

The patient readily consented to go to the Good Samaritan Hospital. After complete anesthesia, assisted by Dr. Pirrung,

a vaginal examination disclosed a small anteverted uterus but no tubes or ovaries could be palpated. On the right wall at a central point between the anterior and posterior vaginal walls was found a decided thickening, and on tracing it up, it felt like a ridge of massed tissue which passed up to the side of the cervix in the vaginal vault. Being still at a loss to account for symptoms I opened the posterior culdesac and on a careful palpation thought I detected a small fluctuant mass in the right broad ligament, but no ovaries or tubes were present, at least none could be detected by the examining finger. Packing some gauze in behind the uterus I then opened up this ridge of vaginal ligament as far as I could.

I thought best at this time to stop searching and make an abdominal section later if her condition would allow it, and I had gained her consent, if no improvement followed this unsatisfactory vaginal operation. The following day the little gauze which had been placed in the ridge tissue was bathed in pus which was constantly being discharged, the temperature subsided and patient made a recovery. For nine months her health has been excellent; never any pain or tenderness, no vaginal discharge, has regained her usual weight, in fact is normal except for the absence of menstrual flow. I present this case to the association with a diagnosis of an abscess of Gärtner's canal.

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DISCUSSION.

Dr. Albert Goldspohn, Chicago.—Mr. President: I can contribute nothing on this subject, but rise to express my admiration for such a study. I saw casually in patients belonging to other practitioners years ago cystic developments in

different parts of the vagina, which were alluded to at that time as of that origin.

Dr. C. C. Frederick, Buffalo.—We see cysts of the vaginal wall not uncommonly, which lie usually to the right or left of the median line, just about the point where the ureter passes below the broad ligament and turns in front of the cervix to come down into the bladder wall to the trigone. I have seen several cases of small cysts of the vagina which I have extirpated at that location. It seems a favorite location. I have oftentimes wondered whether they were in any way connected with Gaertner's duct. Usually these cysts are filled with clear fluid, and look and act very much like cysts in the broad ligament—parovarian cysts, which contain a clear, limpid-like fluid.

Dr. Edward J. Ill, Newark.—I hope the reader of the paper will tell us something about the microscopic appearance of the lining membrane of these cysts which is distinct in itself and will help us out in making a diagnosis.

Dr. Tate (closing the discussion).—Both gentlemen have asked questions that are difficult to answer. If we take the findings as given in literature, many of these cysts seem to be connected with Gaertner's duct. As to the microscopic appearance of the lining membrane of the cyst as an aid to diagnosis, I can answer this by saying I do not know of any cases in which such an examination has been made.

THE PRESENT STATUS OF CESAREAN SECTION

WITH A REPORT OF FIVE CASES.

BY

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I WISH herewith to report five cases of Cesarean section hitherto unreported by me, and at the same time review in a cursory way something of the present status of Cesarean section. Among obstetricians of note who have recently put into definite form the results of the profession's advanced experience in obstetric surgery are Hirst, Norris, Reynolds, Zinke, Williams, Davis, Frye and some others. The operation, in all its relations as a substitute for forceps and version, craniotomy and embryotomy, symphyseotomy or pubiotomy, cannot be discussed at this time, as it is too vast a subject.

The general practitioner throughout the land is the accoucheur preëminent. To him we must look for improvement from year to year in his aseptic technic, in his early recognition of abnormalities, in his improved conduct of the hygiene of the pregnant woman and in the improved conduct of delivery. Both maternal and fetal mortality should be lowered and can be. It is the crying need. Far too many children's lives are sacrificed by failure to recognize malpositions and failure to correct them early and by forcible, brutal and unscientific deliveries. Far too many women and their unborn children die from neglect of attention to the various toxemias of pregnancy in their incipiency. Far too many women develop puerperal sepsis, and when discovered the treatment is not modern nor effective. Every primipara and every multipara who gives a history of previous difficult labor should be carefully examined by her attending physician as early as possible in her pregnancy, with the object of determining all that can be determined as to her general condition, her nourishment and elimination, her probable conduct in labor and as to the presence of tumors, deformed or contracted pelvis or any other mechanical obstructions to delivery.

In this connection we have only to discuss the mechanical obstructions. Any practitioner of experience and observation can,

by a pelvic examination, at once determine the existence of a deformed or generally contracted pelvis, the presence of exostoses or other growths obstructing the pelvis. The measurements which are then made will decide approximately the degree of obstruction to delivery. The capacity of the pelvis can be determined largely by the general "feel" of roominess, whether the promontory of the sacrum is high, far above the examining finger; by the generally curved outlines of the pelvic walls and the ascending rami of the ischium and the descending rami of the pubic bones; by the deep curve of the sacrum; by the width, thickness and angle of inclination of the symphysis as well as the angle of inclination of the pelvic brim.

Norris says: ". . . Is it not time, in view of the modern results of Cesarean section, to formulate a general rule to which there will be few exceptions, that when the true conjugate is less than 7½ cm. in simple flat, and 8 cm. in generally contracted pelvis, Cesarean section at or before the onset of labor, should be the elective operation?" He further adds: "The merits of pubiotomy as an alternative operation are to be determined by future observation and study." There can be little doubt that this statement is a conservative and correct one and one safely to be used as a standard upon which to formulate our decisions for or against Cesarean section.

But the pelves which are just a little larger, say 8½ or 9 cm., especially when the child's head is proportionately larger and we do not know it, thus keeping the relative disproportion between head and pelvis the same, are the ones which prove to be stumbling blocks and lead us into all sorts of difficulties. In that class of cases, when it is not determined absolutely by the pelvic measurements prior to labor that the only safe delivery shall be by the elective Cesarean section, and the patient is allowed to go into her labor, after a long and exhausting effort at delivery, possibly with repeated attempts at instrumental delivery, possibly with attempts at version, we are confronted with the questions, How to deliver? Which way promises most for both mother and child? Is the child living or possibly so injured that it probably will not survive? Is the mother so exhausted that she may or may not survive the ordeal of a Cesarean section? Or has the labor been conducted in a manner so septic that if she survives the operation she will later develop sepsis?

The only way to determine the child's condition is by the strength, regularity and volume of the heart sounds. If it be

thought that the child cannot survive, craniotomy is the best alternative. And right here let me say that the time has passed when any obstetrician can justify himself in doing craniotomy or embryotomy on any but a dead or dying child. The chances a threat in the larger proportion of cases under ordinary environment that all aseptic rules have been violated and that the patient is in a fair way to later septic developments. It has been my observation that a large proportion of patients which I have seen in consultation, in whom frequent examinations have been made and prolonged attempts at delivery have been tried by the attendant and his friends whom he has called in to assist him, have developed sepsis in some form afterward, not a few having proved fatal. When the obstetrical attendant is a general practitioner attending erysipelas and other infective diseases, lancing carbuncles, boils, abscesses and the like, is it any wonder that his patients are infected? If we could but impress upon him the fact that hands infected by contact with virulent discharges cannot be made clean by scrubbing and that he either should wear sterile gloves during his obstetrical attendance or while dealing with infective discharges or better to use gloves in both instances, much of this infection could be avoided.

I believe that the larger mortality in Cesarean section cases, after delayed operation, is more due to subpubic infection before section than to the exhaustion before section. This fact is borne out by the experiences of several operators who have done sections frequently after patients have been in labor for over twenty-four hours under such conditions that the labor has been aseptically conducted. In the hypothetical case just described, if the child is decided to be living and liable to live after delivery, we have to choose between Cesarean section, symphysiotomy or pubiotomy. Symphysiotomy has been supplanted by pubiotomy as being by far the safer operation. Williams, of Baltimore, is the most enthusiastic advocate of pubiotomy, in this class of cases, among the obstetric teachers of the day. Hirst and others predict that it will eventually go the way of symphysiotomy, but time and "future observation and study" only can determine the question.

The mortality for both mother and child in primary elective Cesarean section is practically nil. When the operation is done later as a last resort, the mortality of the mother increases, but that of the child does not. The statistics of pubiotomy would seem to show in this class of cases a little better chance for the mother, but not so favorable for the child as Cesarean section

The principal points to obtain, however, are these: a knowledge long enough prior to term to determine the size, shape and capacity of the pelvis to go to term; then to decide whether to do a premature delivery at 8 or 8½ months, or to do a Cesarean section, or to await the "test of labor" under conditions such that the labor can be conducted aseptically, and if not successful, then to do a Cesarean section under conditions such that the lives of both mother and child may be saved.

Premature delivery in contracted pelves at 8 or 8½ months is a procedure attended with good results, and a child so delivered stands as good a chance of living as at term. Some writers have tried to devise means of determining the size of the fetal head while *in utero*, but it is problematical if anything like an accurate estimate can be made under such conditions. The technic of aseptic abdominal surgery has been brought to a degree of perfection such that Cesarean section, in competent hands, if the patient is not already infected and has enough vitality left to undergo the ordeal, ought to live in a large percentage of instances. Much of the delay and loss of strength of the patient may be prevented during the dilating stage, if it be tardy, by the use of various devices for dilating the soft parts, but among which, it would seem that the Pomeroy bag is the most effective.

CASES OF CESAREAN SECTION.

CASE I.—Mrs. G., age thirty-eight, had born several children at term; at this labor, at term also. It was discovered on examination that a mass which proved to be a large carcinoma of the rectum filled the lower pelvis, preventing delivery. She had been in labor fifteen hours. The cervix lay above the symphysis, partially dilated. Cesarean section done at the Buffalo Woman's Hospital. Male child, living. Both mother and child survived, the mother dying about one year after from carcinoma.

CASE II.—Mrs. S., age thirty-five, in puerperal convulsions, having had several during the previous twenty-four hours; cervix hard and undilated. She was taken to the Buffalo Woman's Hospital and delivered by Cesarean section. The child lived only a short time, the mother recovered and died three months later from renal disease which proved to be an interstitial nephritis.

CASE III.—Mrs. F., old primipara, in labor about eight hours; the pelvis found to be obstructed by a fibroid tumor pushed downward in Douglas's pouch, filling the pelvic cavity. Cesar-

ean section was done at the Buffalo Woman's Hospital. Male child; both mother and child lived.

CASE IV.—Mrs. P., age thirty-five. Found to have a large carcinoma of the cervix and upper vaginal wall, such as to prevent normal delivery. Elective Cesarean section was done at the Buffalo Woman's Hospital, near term; mother and child living. Mother died eight months later from hemorrhage.

CASE V.—Mrs. L., age thirty-two; primipara with a generally contracted pelvis; conjugate about 6½ cm. Patient elected at six months to go to term and have a Cesarean section, desiring a living child. This was done at the Buffalo Woman's Hospital; child and mother both alive and in good health.

THE DEVELOPMENT OF THE HUMAN OVUM DURING THE FIRST EIGHT WEEKS OF PREGNANCY.

AN APPEAL TO TEACHERS OF OBSTETRICS AND TO WRITERS OF TEXT-BOOKS TO CONFORM IN THEIR DESCRIPTION OF THE HUMAN OVUM DURING THE EARLY WEEKS OF PREGNANCY WITH THE FACTS ON RECORD.

BY

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THE descriptions of the impregnated ovum during the first eight weeks of pregnancy, as found in our leading text-books, conflict with well-known facts and should be corrected. All leading American, English and German text-books bring illustrations and descriptions of embryos and ova from the second and third week of pregnancy and they all, without a single exception, state, that at the end of the first lunar month, that is at the end of the fourth week of pregnancy, the human ovum is of the size of a pigeon's egg, and that the embryo at this time measures from seven to ten millimeters. Besides copying the well-known illustrations from the works of His, Reichert and others, each writer of a text-book usually brings an illustration of one of his own cases; thus Edgar shows an unruptured human ovum of perhaps the sixth or seventh week, describing it as from the third week, and Williams brings an illustration of a beautiful specimen in the anatomical museum of Johns Hopkins University, also of about six or seven weeks' development, describing it as a seventeen days' pregnant uterus.

Now all these authors follow the time-honored method of Hippocrates and divide pregnancy into ten periods of twenty-eight days or lunar months, and they describe the human ovum and fetus at the end of each of these ten periods, and they all go on record and state: At the end of the fourth week of gestation, the human ovum is of the size of a pigeon's egg, and the embryo measures from seven to ten millimeters in length.

All these statements are misleading and confusing to students, and they are annoying to the teachers of obstetrics. The fact is, that no human eye has ever seen an impregnated ovum belonging to the first period of four weeks of a forty weeks' pregnancy.

The youngest human ovum of which there is a reliable record, is the one described by Peter, of a girl, who should have menstruated on September 28, 1885, and committed suicide on October first of that year, because she considered herself pregnant. This ovum, which has become so well known, was fully embedded and of the size of a hemp-seed. It belongs to the middle of the fifth week according to the established way of counting. Another ovum, a trifle smaller, has lately been described by Leopold, but unfortunately, there is no record of the date of the last menstruation. Investigators, the world over, have during the last thirty years been on a continuous lookout for youngest human ova with the following result: During the first four weeks, counting from the first day of a last normal menstruation, no ovum has ever been found in the uterus. If you consider how searching the investigation has been, and how it has been aided by millions of curetments and many thousands of hysterectomies, you must come to the conclusion that as long as the mestrual period is not overdue, the impregnated ovum has not entered the uterus, and there is no harm in the universal practice of examining, sounding and treating women, who are not behind in their menstruation.

On the other hand, just as soon as a woman's menstruation becomes overdue, the impregnated ovum may be found in the uterus; the luckiest investigators found ova of the size of a hemp-seed fully implanted on the third or fourth day after menstruation was due, that is to say, in the middle of the fifth week; all of us have been looking for these youngest ova, and we considered ourselves lucky when ten, twelve and more days after menstruation was due, we were able to secure ova, varying in size from a small cherry to a pigeon's egg, but all these ova belong to the second lunar month of pregnancy; the earlier ones usually to the sixth week. Many of these ova have been turned over to embryologists, who have studied the degree of development of the embryos, and have estimated their age by comparison with animal embryos. His in 1880 published a description of sixteen embryos, obtained in this manner; he estimated their age at from twelve days up, and came to the conclusion that twelve of the sixteen embryos, so examined by him, resulted from the impregnation of the ova of the menstruation which had been missed, and not from the last normal menstruation. From this publication of His, date the illustrations which we so universally find copied in our text-books on obstetrics.

The description given in the text-books of ovum and fetus at the end of the eighth week or the second lunar month, are proven correct by our daily observations, namely, that the ovum is about of the size of a hen's egg, and that the fetus measures about four centimeters in length.

The changes in the description of human ova in our text-books of obstetrics, which I advocate, apply therefore to the first two lunar months of a forty weeks' pregnancy only, and should be as follows: during the first lunar month no impregnated human ovum has ever been observed, we know, however, that during this period the uterus is empty; that during the first part of this period, pregnancy does not exist, and that the part of this period in which pregnancy exists, is consumed by the migration of the impregnated ovum through the Fallopian tubes. We have reason to believe, that, as a rule, the impregnated human ovum reaches the uterus on the day on which menstruation becomes overdue, because, in spite of the most vigorous search of an immense material, carried on through many years by competent investigators, the uterus has always been found empty, as long as menstruation is not overdue, while, on the other hand, the youngest human ova on record have been found three or four days after menstruation failed to appear.

At the end of the fourth week of pregnancy, the human ovum must be small enough to pass through the uterine end of the Fallopian tubes, and cannot be larger than a millet-seed. During the second lunar month, the impregnated ovum grows rapidly, and develops from a body of the size of a millet-seed to that of a hen's egg. The youngest ova on record date from the third and fourth day of the second lunar month, they were fully implanted and of the size of a hemp-seed; at the end of the fifth week the ovum constitutes a small vesicle, covered with chorionic villi, and measuring about one centimeter in diameter; at the end of six weeks the ovum is of the size of a pigeon's egg, and the embryo measures from seven to ten millimeters in length; at the end of the eighth week, the ovum is of the size of a hen's egg, and the embryo measures about four centimeters in length.

These are the changes which should be made, irrespective of what the author's opinion may be regarding the relationship of ovulation and menstruation, and irrespective of his opinion in the question whether, as a rule, the impregnated ovum belongs to the last normal menstruation, or whether it belongs to the period which has been missed.

These questions were much discussed twenty-five and thirty years ago, and it seemed then, that the so-called new theory had won the day. This theory taught that ovulation preceded menstruation a few days; that, as a rule, impregnation occurred as soon as the ovum reached the ampulla of the tubes, and that the impregnated ovum, as a rule, belonged to the menstruation which failed to appear; that the appearance of the menstrual flow, in fact, was a sign that a chance for impregnation had been missed.

The leading text-books of the present day, however, seem to return to Pflueger's theory, that ovulation and menstruation are simultaneous phenomena, and that it is the ovum of the last bloody menstruation which, as a rule, becomes impregnated. This appears very strange when we consider that a great deal of unshaken testimony had been produced in favor of the new theory, while not one single fact can be brought forward in support of the theory that the ovum of the last normal menstrual flow, is the one which becomes impregnated.

Pflueger's publications date from the year 1865; he believed that ovulation and menstruation take place simultaneously, and considered menstruation the means by which nature prepared the uterus for the implantation of the ovum. The first protests against this theory were raised in 1871 and 1872, but it was Aveling who, in 1874, in the *Obstetrical Journal of Great Britain*, p. 209, gave the first lucid description of the menstrual changes in the uterine mucosa in support of the new theory. The same agent, which causes an ovum to mature and a follicle to rupture, causes likewise a periodical swelling of the uterine mucosa, and thereby renders it suitable for the implantation of the ovum; if such implantation takes place, the swelling of the mucosa continues until the so-called decidua menstrualis is changed into the decidua of pregnancy. When impregnation does not occur, or when an impregnated ovum passes through the uterine cavity without becoming implanted, the mucosa returns to its normal condition. This swelling off of the mucosa is usually ushered in, and assisted by the escape of blood. Aveling quite aptly compares these changes in the uterine mucosa, to the formation of a nest for the reception of the impregnated ovum, and to the throwing off of such a nest, when there is no chance to utilize it.

Aveling's opinion about the changes in the uterine mucous membrane was soon confirmed especially by the beautiful work of Leopold in 1877 (*Archiv. für Gynäcologie*, vol. ii, p. 110),

and when His, in 1880, showed that of the 16 embryos, which he examined, twelve without doubt originated from ova of the first suppressed menstruation, the new theory seemed firmly established.

In 1883, Leopold published (*Archiv. für Gynäcologie*, vol. xxi, part 3) his investigations about ovulation and menstruation, and came to the conclusion that during the period of congestion preceding menstruation a corpus luteum is more apt to develop than at other times, but that follicles may rupture at almost any time. In 1885 followed the discovery and description of Peter's ovum, which likewise supports the new theory.

In 1896 (*Archiv. für Gynäcologie*, vol. xlv), Leopold, together with Mironoff, published further observations made from the examinations of extirpated ovaries in regard to ovulation and menstruation. The material was not free from objections, and the conclusions were different from those reached on the former occasion. Leopold now claimed that the menstrual flow is usually, but not always, accompanied by ovulation, and that ovulation at any other time is a rare occurrence. It seems to be the influence of this publication which has caused a revival of Pflueger's theory; however, without good cause. The statement that ovulation invariably takes place during the menstrual flow, is contradicted by Leopold's own publications of 1883, and by the frequent cases of conception in the absence of any menstrual flow. Such cases are frequent in nursing mothers, they are not rare in girls who cohabit regularly before they have menstruated for the first time, and they are numerous in cases of women who get married a week or so before an expected period, and who never menstruate again until after the first baby is born.

At any rate, we know that twenty-eight days after the beginning of the last menstruation, the impregnated ovum is almost a microscopical body and just in the act of entering the uterus, and we may take our choice, whether we consider this degree of development as attained in a few days, or whether we wish to believe, that it has taken three or more weeks to accomplish it.

Personally, I have always taught the new theory. Fruitful cohabitation can take place at any time between two periods. When the spermatozoids have reached the tubes, they are in such favorable surroundings that they will remain alive and active from one period to the other; Dührssen has found them so in the Fallopian tubes after three weeks; in the domestic hen they remain active for many months and fructify the descending

eggs; in the female bat, they remain active from the time of copulation in fall, to the time of ovulation in spring, and in the queen-bee, they remain active for a number of years. There can, therefore, be no reasonable doubt of the ability of human spermatozoids to remain alive and active from one menstruation to another, when once in the favorable surroundings of the tubes; and it is safe to say, the ampullæ of the tubes in a woman, who cohabits regularly, always contains a multitude of spermatozoids, so that the ovum which leaves the ovary a few days before the expected menstruation, becomes impregnated at once; and that during the passage of the impregnated ovum through the tubes, there is not much change of size, if any.

It is likely that the observations of Spee on the guinea-pig can be applied to the human ovum, namely, that the Zona pellucida protects the ovum during its travel through the tube, and is stripped off in the uterine cavity when the ovum becomes permanently implanted.

DISCUSSION ON THE PAPERS OF DRS. FREDERICK AND SCHWARZ AND ON THE PRESIDENT'S ADDRESS.

DR. ROLAND E. SKEEL, Cleveland.—It is not generally known, I presume, that a Fellow of this Association was the first in this country to perform vaginal Cesarean section. I wonder if we cannot persuade Dr. Stamm to say a few words about that operation, as he was the first to do it after Dührssen.

DR. MARTIN STAMM, Fremont.—I think it is about five years ago that I read my paper at the Chicago meeting of this Association in which I reported two cases of vaginal Cesarean section. Our President, Dr. Zinke, has said that these operations should be performed in hospitals, and I fully agree with him; but my first case was operated on at a private house, sixteen miles from my home, as I did not think the patient was in a condition to be moved, and I did not want to let her die for the want of hospital care. She made a good recovery. She was pregnant about seven months and a half; the baby took a few gasps and died.

The second case I saw in the evening about eight o'clock in the country. I did not want to do the operation in the country; I thought possibly I might wait a few hours, and I told the attending physician to bring her to my place and I would operate as soon as the sun rose. He brought her in about four o'clock in the morning; it was in summer, and about five o'clock she was delivered. The baby lived two hours; the mother recovered. About ten months after this operation she gave birth to a child seven and a half months old.

About two years ago I saw a case at full term in which I proposed vaginal Cesarean section, but it was opposed by the family,

and the woman died. About three months ago I had the case of a woman, pregnant seven and a half months. I delivered her in the same way; she recovered, the baby lived about a day and a half and died.

Six weeks ago I had a case at term. She had about six convulsions within three hours. I operated on her at the hospital. The parts were edematous; the cervix being very much so, with an opening just large enough to admit one finger. It was rather difficult to peel the bladder back, and so this was only partially done. I then made an incision intrauterine into the cervix and one posteriorly, introduced my hand, and dilated, and in two minutes I had the uterus sufficiently dilated to admit my hand, made version, and delivered. The child is living to-day, and the mothe made a good recovery. I operated on another case for carcinoma of the cervix.

As President Zinke has said, I can especially recommend the operation in eclampsia, and I think in cases of placenta previa it will be the operation generally adopted.

I would like to hear Dr. Zinke say something about modern Cesarean section, extraperitoneal, Sellheim's method. He has not mentioned it in his address, and I wonder if any of the members have performed it. It seems to offer some prospect for future consideration.

Dr. Z NKE.—Sellheim himself has abandoned the procedure because of the favorable results obtained by hebosteotomy.

Dr. William A. B. Sellman, Baltimore.—I feel certain that I voice the sentiment of every Fellow of this Association when I express myself as being pleased with the President's scholarly address, which covers the ground thoroughly, which will add to the value of our Transactions, and which will be distributed throughout the entire world. I wish to move that we express our thanks to President Zinke for the painstaking and careful manner in which he has collected his data and for the scholarly way in which he has expressed his thoughts.

(This motion was seconded by Dr. Schwarz and unanimously carried by a rising vote.)

Dr. Miles F. Porter, Fort Wayne.—I do not think these papers should be allowed to pass without further discussion. I doubt very much if there is to-day a more important subject or subjects before the medical profession than those that have been presented to us this evening. If there is one thing I am thankful for, it is that I have never made a craniotomy on a viable child, and, God helping me, I never will. It occurs to me that we are in a position to-day to say that there are better and safer methods of delivering a primipara than by even the ordinarily difficult high forceps operation. It has been my privilege on two occasions to make what I call an elective Cesarean section. One was in the case of a healthy multipara who had had several previous normal easy labors, who came to labor, and upon examination was found to carry a large pelvic

tumor or cyst. After the delivery of the tumor in the ordinary way, I delivered her of the child through the belly, because I felt certain that under these circumstances I could empty the uterus with less risk to the mother and child, not only so far as concerns the risk to life, but the morbidity itself. than allow her after an ordinary abdominal section to go through an ordinary labor.

The other was done in a primipara with placenta previa at term. As I said before, the question of morbidity as well as mortality should be considered. After considerably more thought than experience on this question, I am inclined to believe that abdominal section done under favorable circumstances should not have a mortality of more than 2 per cent., and that means 2 per cent. to the mother. What is the mortality to the child? I do not hesitate to express my belief that time and experience will prove that abdominal Cesarean section gives the child a better chance for life than labor in the ordinary way. Therefore, I am very much inclined to believe that difficult labors in the course of time will be comparatively few, and that instead these mothers will be delivered by abdominal Cesarean section.

In looking at the question from all sides as well as I can, without having had any experience in vaginal section, I cannot understand the logic or the reason in a case of placenta previa, in the presence of a viable child, of doing a section through the vagina. That is where the placenta is; that is where you will have hemorrhage. After the delivery of the child, you will have the ordinary traumatisms incidental to the delivery through the natural tract. These uteri can be attacked safely through the abdomen, and the rule is that the recoveries are infinitely less bothersome than recoveries from ordinary normal labor. As a matter of fact, the women are not sick at all. Of course, accumulated experience alone can tell accurately what the subsequent dangers of abdominal Cesarean section are. What is the necessary danger from subsequent rupture of the uterus? What is the subsequent danger that may follow from the development of hernia? What is the danger that may follow from the development of intestinal obstruction? Taking all of these things into consideration, I am very much inclined to believe now that in the future abdominal Cesarean section, in many of these cases, will be the method of delivery adopted by choice, for the reason that it gives the mother as good a chance as any other method and gives the child an infinitely better chance than does any of the other methods known. This must be an individual question very largely, but I cannot conceive why it takes any more time for a man to deliver a woman through an opening in the belly, or any more effort to become proficient in doing that than in becoming proficient in making a high forceps operation.

My own judgment is that it is possible, in a given individual, to teach him to do Cesarean section with greater certainty and

in less time than to teach him to make a high forceps operation. If that is possible, then the question arises, Which of the two operations are you going to adopt? For myself, I shall never make another high forceps operation in a primipara unless the vagina and pelvis are capacious and the position favorable.

One idiot is living because I did it; I will never cause another, and if a woman will not let me deliver her in the way I think she ought to be delivered, then I will withdraw from the case. Personally, I will never knowingly submit a primipara to a tedious high forceps operation while I live and retain my right senses.

Dr Edward J Ill, Newark,—This is a very large and important subject, and so far as I can see, neither the President nor Dr. Frederick has spoken of the soft parts of the mother. They have spoken of the immediate results of operations, but not of the ultimate results. It does not seem to make much, if any, difference what sort of operation we do from below, every now and then we will injure the woman to such an extent that she will never be well again. We will produce lacerations of the cervix extending into the broad ligament, extending down the vagina into the perineum, and producing such atrophy of the pelvic cellular tissue that the woman never recovers her health.

I have had a very good chance of seeing a few cases that were operated upon by prominent men abroad by vaginal Cesarean section, and I have seen extreme injuries result from that operation. Had the operation been done through the abdomen and the fetus removed in that way, the woman would have been left in good condition, provided the operator knew how to sew up the abdominal wall.

As to the high forceps operation, there is still a place for it. Our worthy President has told us that these cases should go to the hospital, and that is where they go after many manual and instrumental efforts. The patient may have fever and may be exhausted; the fetus is likely dead. If the fetus is living, its pulse is poor. Now, if we do a Cesarean section on that patient, she will surely die of sepsis. In such a case the high forceps operation is still the best. If in such a case we do section of the pubes, the patient is likely to die from sepsis. When this operation was first done, we find accounts of all the accidents that were happening. These were hemorrhage that could not be stopped; there were injuries to the bladder; pieces of dead bone were removed later, and many such things. These patients were considered as having recovered, but they really never are well afterward. It is true they recover from the operation, but the principal object is not only to have the women recover from such an operation, but to be well afterward. After such an operation a woman should be permanently well, and she is well after Cesarean section.

One word with regard to Cesarean section in cases of puerperal convulsions. Dr. Frederick spoke of that. In my service Cesarean section was done about twenty times for puerperal convul-

sions. In none of them did we do it in multiparæ. They were all primiparæ and the result is highly satisfactory. Multiparæ get along well by other means than Cesarean section.

Dr. John A. Lyons, Chicago.—I am very glad to have heard the remarks of Dr. Porter and Dr. Ill with regard to the importance of Cesarean section in some of these cases. It is very difficult to get general practitioners to send these patients to the hospital. If these pelves are contracted, they usually let them go on until they have been in labor from forty-eight to seventy-two hours; at this late hour both mother and child are likely to be lost if sent to the hospital for a Cesarean operation. We need this kind of discussion not for the tyros in the profession alone, but to benefit many good obstetricians as well as ourselves.

Dr. Frederick (closing the discussion).—In Germany I think there is too little consideration shown to the child. I think also among a great many general practitioners in this country too little consideration is shown to the child. The teaching of the Roman Catholic Church among Roman Catholic practitioners to a certain extent counteracts this want of consideration of the child. I believe the child has its rights which should be considered, and the mother has her rights which should be considered. I do not think the mother should be the sole object of solicitude, but the child also should have its share of solicitude. Therefore, an operation which in the hands of the largest number of operators proves to be the most successful in saving both mother and child as to the point of mortality first, and next as to the point of morbidity, is the one that will eventually be crystallized and depended on.

We are in a certain stage of uncertainty. Changes have been going on. Without question, this will be sooner or later pretty thoroughly crystallized, so that we will undertsand our status, so to speak. Before we get to that point, we must educate the general practitioners, they who are the obstetricians to examine their patients early in pregnancy or as soon as they are engaged for obstetric work. They must know what the condition of their patients is. All of us know that there are general practitioners who are engaged in attending women in confinement who never examine their urine to know whether they are eliminating or not. They pay little or no attention to hygiene. They do not resort to external palpation to determine whether the fetal head is up or down, crosswise, or in any other position, and up to the time of labor they have not given these women personal consideration. They do not know whether the fetal head is in occipitoanterior or posterior position. If the head is slow in coming down, they apply forceps without changing it to an anterior, and drag the head down through the birth-canal, either killing the child or making an idiot of it, and possibly tearing the pelvic floor.

As to asepsis, I have seen many violations of it in cases in which I have been called in consultation. A practitioner will wash his

hands and then pick up something off the floor or he will use a forceps that has dropped on the floor, thus breaking the chain of asepsis Until the general practitioner is educated to a certain point, we are going to continue to have no improvement, either in the mortality or morbidity statistics, in obstetric practice. You can discuss pubiotomy, Cesarean section, symphysiotomy, and all other otomies from a scientific standpoint, but when you come to absolute practice there is trouble. I have many times said during recent years that the woman in labor who was picked up on the street, who had no place to lay her head, and taken to a maternity hospital and delivered, had a better chance than the rich woman in a mansion, with trained nurses and obstetrical attendants.

Dr. Zinke (closing the discussion).—I feel deeply grateful for the expressions of appreciation on the part of the Fellows with regard to the proceedings of this meeting thus far. Those of you who will take the trouble to read the papers presented this evening and the discussion following them will have little doubt as to the correctness of the logic expressed and the justness of the conclusions to which the authors have come. We are on a campaign of education with reference to obstetrics. A great deal has been done for mankind in every other department of medicine, but obstetrics has been sadly neglected, especially in private practice. If we would only do as much for the pregnant as we do for others who come to us for treatment, women would stand a better chance to recover from the effects of pregnancy, labor, and confinement than at the present time. There is no question in my mind that many fathers and mothers often dread the thought of marriage of their daughters; when married they are in dread of pregnancy; when pregnant they fear the hour of confinement. Many of the young married women avoid pregnancy for that reason.

It is to be hoped the time is not far distant when the laity, as well as the profession, will realize the necessity that cases of obstetrics should be as closely observed and studied as well as all other cases. When conditions present themselves which indicate that there may be complications near or at the time of confinement, the patient should be sent to a place where she can be safely conducted through the event of labor.

INTRALIGAMENTOUS FIBROIDS.

BY

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(With Illustrations.)

DURING the past seven years I have operated upon sixty-one cases of fibroids, doing forty-eight hysterectomies and thirteen myomectomies. Of this entire number I have met with five cases of intraligamentous fibroids, one of which was a case of multiple fibroids of the uterus, with two discrete ones in the right broad ligament. The remaining four were true intraligamentous fibroids in the full sense of the word. None of these intraligamentous masses in any of the five cases had any association with the uterus, except one in which the association was due to an inflammation occurring in the pelvis, and an exudative or plastic adhesion to the uterus was evident.

In looking up the literature in the spring of 1907, when selecting this title for a paper to have been read before this Association at its meeting in Detroit, I was struck by the fact of the few cases being cited and by the meager descriptions in the text-books of the present day. Such a strong impression was made upon me that I felt that this subject is either an exceptionally rare one or so common as not to deserve mention. I am now firmly of the belief that the condition, while not unusually rare, had not been well written up at that time, and am more than ever of such an opinion after reading the excellent paper of James Vance, of El Paso, Texas, published in the *Annals of Surgery* of 1907, p. 854, vol. xlv, No. 6. In the above-mentioned article Vance says: "It is only in cases of broad ligament development alone, associated with a perfectly normal uterus, that the primary origin is so obvious as to compel the attention of the surgeon. Such cases are very rare, there occurring only four in the past eleven years in the American literature."

As stated above, I record in this paper four out of five in which just such a condition of normal uterus existed with the fibroid, the fifth being the case of multiple fibroids of the uterus and two

in the ligament. It is also an interesting fact that these tumors are usually single. The four mentioned above were single fibromata.

Vance is quite settled in his convictions that these growths are neither budding offshoots from the uterus nor pedunculated subserous ones that have finally separated from the parent stem, but that they are primary developments in the broad ligament. "Numerous authorities are cited by Krekels to show the independent origin of these growths. That fibromyomata are found within the broad ligament as well as in the uterus is natural, since the same smooth muscle fibers and connective tissue are found here as in the uterus." (Vance, *Annals of Surgery*, vol. xlv, No. 6, p. 863.)

The ages in my five patients were forty-two, forty-eight, forty, forty-four and forty-nine. All were married except the one forty-two years of age, and she had been a widow for several years at the time I was consulted. The sizes varied greatly. In the one with multiple fibroids of the uterus and two in the broad ligament, one of the tumors was the size of a filbert, while the other was as large as a hen's egg. The largest was one of the left side and in the patient forty-eight years old. It extended above the umbilicus, and was judged to weigh thirteen to fifteen pounds. The next in size was also a left-sided one, perfectly round, of rather soft consistence and as large as the inflated gas bag of the present-day ether inhaler, weighing ten pounds. The remaining two were both right-sided, one as large as the largest grape fruit, the other but slightly smaller.

The histories in regard to growth are illuminating in but two, and these were the largest ones. One observed her growth for five years, and its growth was so rapid as to lead one to suspect a cyst of the ovary or an intraligamentous cyst, although I stated distinctly that I thought it to be a fibroma. But one of these single growths was nodular, Vance stating that when large they usually are. In four of these cases the tumors were hard or of the same consistence as ordinary fibroids. In the large round one the feeling was of a decidedly soft nature. The edematous condition spoken of by some authors was not observed in any of my cases, although the largest one, which was somewhat pear-shaped with the apex down, had perforated the anterior vaginal wall and was very adherent. Such a condition of edema may have existed in this case, with a subsequent inflammatory change producing sloughing and perforation of the

vaginal wall, but the patient's history was negative as to any pelvic inflammation.

Diagnosis.—This condition is usually confused with that of an intraligamentous cyst, although from my experience in the five cases cited in this paper, the deflection and elevation of the uterus in the large tumors is greater than in intraligamentous cysts. I am satisfied that no positive conclusion between the two can be formed until the abdomen is opened. The menstrual history is not one to base any definite conclusion upon. This fact is also well borne out by Vance, who says, "The unaffected condition of menstrual function is the most constant symptom remarked upon by all authors."

Pressure symptoms are absolutely allied to those of intraligamentous cysts and fibroids. The growth is usually slow, this being in contradistinction to intraligamentous cysts. Immense elongation of the vagina, with a tumor, not movable to any great extent, that can be definitely stated as being harder to palpation than cysts, with the uterus tilted to one side and raised above the symphysis, is very likely to be an intraligmentous fibroid. Treatment is distinctly operative, and varies with the size and position of the growth from a myomectomy or enucleation to a hysterectomy. In the case of multiple fibromata I did a myomectomy, removing six from the uterus and the two from the ligament. In the remaining cases supravaginal hysterectomy was done. In the operative treatment two dangers are distinct. First, that of hemorrhage from the iliac and its branches and, secondly, the danger of ureteral trauma.

Hemorrhage.—Two of the five cases operated upon were accompanied by terrific hemorrhages. The first hemorrhagic case was in the patient with the large pyramidal tumor, mistaken throughout by all, even during the operation, for a large myomatous uterus (see history). The cleavage was badly made owing to a dark day and a very poorly lighted operating room. Vessels were found in the broad ligament and covering the tumor a half-inch in diameter with extremely thin walls. In lifting the incarcerated tumor from the pelvis numbers of these branches were torn and bled profusely. Withal, the patient's recovery was without any incident of unusual note.

The second instance (see Case II) was in the case of recent and existing inflammation, the patient having a temperature of 102 at the time of the operation. Her hemorrhages were exceptionally severe, and evidently came from the broad ligament plexus,

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deep down in the pelvis and close to the pelvic wall. It was necessary to place very firm packing between the tumor and the pelvis having an assistant make firm pressure upon the packing, and then, to save the patient's life, I hurriedly dissected the tumor up from its posterior attachment. Upon removing the packing, the spouting vessels were readily seen and clamped.

Ureteral dangers are, in my opinion, only marked in cases complicated by preexisting inflammations in the tumor or broad ligament or in cases with tubal or ovarian adhesion involvement. In the previous inflammatory cases, of whatever variety, the ureter can be so closely matted to the tumor as to be injured by hurried dissection, as was necessary in Case II. In Case II, while hurriedly releasing the tumor from its posterior and inferior association, no good cleavage was obtainable, and as a fearful hemorrhage was in progress I began to work hastily, and suddenly found a hard infiltrated cord between my fingers and entering into a portion of the tumor. I took it to be a large vessel or the ureter. Upon investigation it was proved to be the ureter, which was buried in the adhesions and closely associated with the tumor. Careful dissection, after the hemorrhage was checked, released the ureter without damage. In the noninflamed and nonadherent cases the tumor usually peels out without danger to the ureter, this latter structure being separated from the tumor by a fair amount of intercellular structure. Furthermore, no anatomical reason exists for ureteral danger in the ordinary case, except the usual one near the cervix when doing a hysterectomy.

The choice of operation, as stated, lies between myomectomy and hysterectomy. Myomectomy is the operation of choice when the tumor enucleation is feasible with readily controlled hemorrhage or the tumor is small enough not to push the uterus out of the pelvic cavity and leave a raw space in the broad ligament of such dimensions as to be provocative of malpositions by lateral or posterior tilting, thereby requiring subsequent operation. Also, certainly, myomectomy should be the operation of choice in young adults with child-bearing possibilities.

Hysterectomy.—Where the tumor is large, enucleation will leave an immense cavity with loss of lateral support in the broad ligament which is very likely to be productive of retrodisplacements and lateral deflections which will eventually call for secondary operations. A further and a very potent reason for hysterectomy is that of the control of hemorrhage. Age as a factor lends its weight after forty.

Case I.—Mrs. J., forty-eight, Bridgeport. Referred to me by Dr. R. J. Lynch. Came under my observation on September 12, 1905, and gave the following history: has had four children, the first pregnancy occurring at the age of sixteen. She has been regular in menstruation as to time and quantity, never soiling more than three napkins daily and this condition continuing for about three days. Had never noticed anything except a lump in her sight side, which was movable, about eight years ago. She said that there had been an appreciable increase in size lately. Dr. Lynch stated that it had more than doubled in size in the last three years. She states that it has been impossible for her to retain her urine for the past two years, as it "continually leaks away" during the entire time she is walking, and that she must arise three or four times at night to void urine. Her bowels move regularly and she suffers some pressure discomfort.

Examination reveals a mass fairly movable, inclining more to the left than the right, extending above the level of the umbilicus, and having to the palpating hand the shape, density and the like of a large fibroid uterus. By vagina a distinctly confusing palpation picture is presented. A conical mass (see illustration of Case I), the apex of which is the size of a small orange, presents in the vagina, encroaching upon the left side mostly and descending to within an inch and a half of the vulva, with a tongue-like process that was about two inches long and an inch and a half wide and covered by a perfectly smooth membrane. No external os could be felt. Ocular examination through a speculum presented no evidences of an external os, and demonstrated that the tongue-like protrusion was covered with what appeared to be true mucous membrane. Operation was advised and accepted.

She was operated upon on the thirteenth day of September in an improvised operating-room, poorly lighted and upon an extremely dark afternoon. A long median incision exposed a tumor with all the character of a diffuse fibromatous uterus, covered with veins fully a half to three-quarters of an inch in diameter. There were no adhesions, but the tumor was absolutely fixed in its lower half, the apparent mobility found at the first examination being due to the swing of the upper half of the tumor upon its lower half. The left round ligament could not be demonstrated. The left broad ligament was extremely short and tense, also containing immensely dilated veins. The ordinary steps of doing a bilateral clamp hysterectomy were proceeded with,

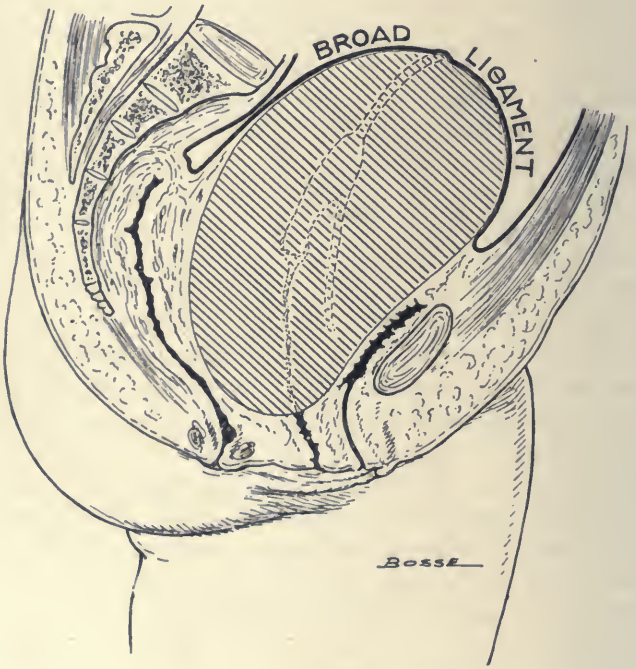
accompanied by great difficulty in the left side, the latter due to the fact that we could not or did not know the exact nature of our tumor. Had I recognized it as an intraligamentous fibroid, I feel that the greater difficulties met with could have been obviated. Repeated tearings of vessels, owing to thin walls, were followed by terrific hemorrhages until the pelvic portion of the tumor was reached. After this it was a simple matter, although the growth had ulcerated into the vagina, to complete the hysterectomy from left to right and from below upward. A careful peritoneal toilet was made, her appendix removed, and the patient placed in bed with instructions to give a large salt-solution enema. The patient recovered.

Examination of the tumor proved interesting. Search was made for the external os with great care, but none was found. A transverse section was made three inches up from the apex, with like result. Another incision three inches higher with like result. The third section, three inches higher, gave evidences of a small canal lined with mucous membrane, simulating the vagina. This was traced up and to the extreme right of the base of the tumor, and perfectly free from it except by cellular tissue we found a normal-sized uterus. The tumor measured fourteen inches in length, eight inches wide at its base and five and a half inches through at its thickest portion. It was estimated as weighing between twelve and fifteen pounds.

Case II.—Mrs. L., age forty, mother of several children, menstrual history negative. Referred to me by Dr. Spanier on May 23, 1907, when I saw her in Brooklyn. At that time she had a temperature of 102⅕ and a pulse of 110. She was unable to retain her urine, and had been treated by some local physician, up to the twenty-second of May, for a cystitis (?), being catheterized, without obtaining diagnostic urine. Dr. Spanier, when called on the twenty-second, made a diagnosis of pelvic abscess encroaching upon the bladder to such a degree as to be productive of the frequency of micturition. Upon examination I found a large mass to the right, extending well above the crest of the ilium and down into the pelvis, quite painful to the touch, not mobile, and a bladder absolutely empty. A diagnosis of inflamed fibroid was made, with possible pelvic abscess.

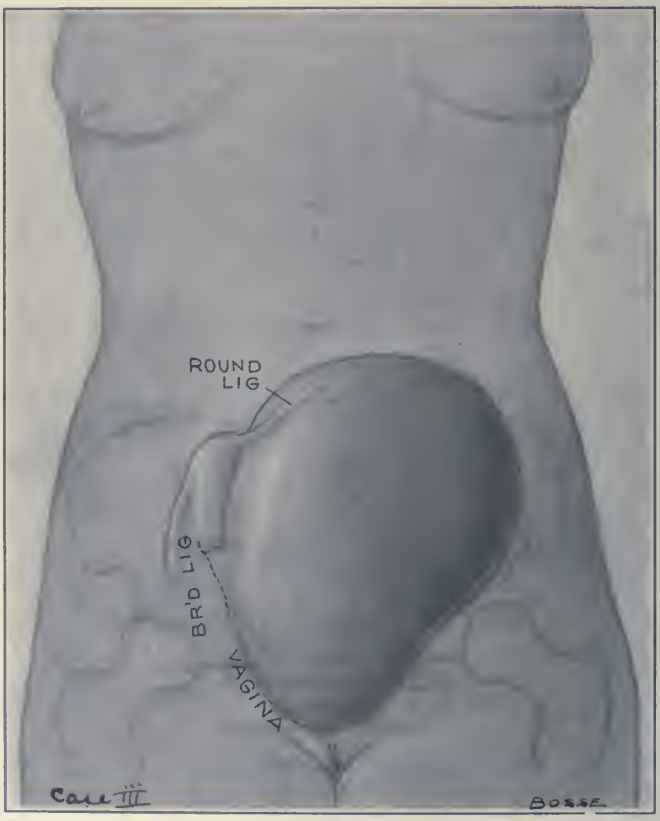
On May 23 she was operated upon by me at the Private Hospital Association. It was seen immediately upon exposing the tumor that I had a right intraligamentous fibroid to deal with, and one that was held in the pelvis by a newly formed exudate. The

broad ligament was cut just back of the round ligament and a cleavage readily found in the entire superior aspect, but upon making blunt dissection with the finger below the pelvic brim a fearful gush of blood was met with. Packing rapidly with a wet towel and pulling up on the tumor, while my assistant made firm pressure upon the packing, I began rapid dissection below, until meeting with a cord-like band, the size of a lead-pencil, that apparently had entered into the tumor. This I thought might be a large vessel, but upon observation I found it to be



CASE II.

the ureter. The hemorrhage was checked, and then careful dissection released the ureter from the mass. At this stage I was able to raise the tumor sufficiently to clear it from association with the uterine artery. The uterine artery was clamped and a supravaginal hysterectomy was done from right to left and from below upward. There was absolutely no association with the uterus, except by inflammatory exudate, the uterus, being perfectly normal in all macroscopical aspects, and lay well elevated from the pelvis and to the left, the cervix being behind and above the pubes. The question of drainage was decided in



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the negative, although I felt that my judgment in this case was rather shaky. Some seven or eight days of a fair convalescence followed, then a rise in temperature to 104 degrees, preceded by a chill, with pain in the right side, occurred. This necessitated a vaginal puncture and drainage for a few days, and was followed by an easy convalescence. The tumor was the size of a large grape fruit.

Case III.—Mrs. H., forty-four, Carlstadt, N. J. Recommended by Dr. Sittenberg, September 29, 1906. Has had several children, the last child about five years ago, when she noticed some enlargement of the abdomen, since which time she observed that her abdomen was growing rather rapidly. Menstrual history was absolutely regular until three weeks ago, when she menstruated a second time within four weeks. Subsequently she menstruated twice more in three weeks, each of these periods being of two or three days' duration. There are no rectal or vesical symptoms. Complains only of a sense of weight in the left side and of the physicial appearance, now appearing to be seven months pregnant.

Examination.—Large, moderately fixed, circular tumor. Uterus can be palpated through the abdominal wall to the right, high up. Diagnosis is made of a broad ligamentous cyst, or intraligamentous fibroid. Operation done a few days later at the Private Hospital Association. Preliminary examination under ether, diagnosis in all probability intraligamentous fibroid, although rather soft.

Upon opening the abdomen it was rather a question by palpation, as the tumor had a decidedly fluctuant feel, between a thick-walled cyst and a fibroid. Splitting the layers of the broad ligament, a cleavage was found that throughout the enucleation was productive of no loss of blood nor adhesive obstruction. This was a typical case for enucleation except for the immense cavity left, so hysterectomy was decided upon. The uterus with the tumor was pulled to the right, and a supravaginal hysterectomy was done from below upward and from left to right (see Fig. Case III). The patient was discharged to her home on the fourteenth day.

Case IV.—Mrs. G., forty-nine years of age, consulted me on June 5, 1907. Married twice, the second marriage about one year before admission. Gave a history of having one son twenty-one years old. No other living children. No menstrual history of any difficulties, delays or floodings until the past month, when she skipped. When seen by me she was in her sixth week with-

out menstruating, had some symptoms of pregnancy which could have been attributed to worry, also some slight painful contractions in her right side. Vaginal examination showed a movable mass about the size of a four to six weeks' tubal pregnancy. She was told that it was possible that a tubal pregnancy existed, although a cystic ovary, etc., might be present. Operation was advised. She was referred to a leading gynecologist, who not only confirmed my conclusions, but insisted that for her good she be operated upon without delay. She readily consented, and was operated upon the following day.

Upon making a bimanual examination under ether, the mass before mentioned was easily mapped out and, in addition, a tumor of the right broad ligament was found. Abdominal section revealed an intraligamentous fibroid of the right side about the size of a grape fruit, and in the pelvis a cystic ovary the size of a hen's egg. Hysterectomy was readily done, and the patient discharged to her country home on the twelfth day.

CASE V.—Mrs. C., referred to me by Dr. Alport, of Chicago, in September, 1901. A widow, forty-two years of age, the mother of three children. No other pregnancies. Complains at present of a frequent desire to urinate and some pressure sense about the bladder and rectum. Had worn a pessary "for an anteversion" for one week before visiting me. Menstruation regular and not excessive, but she thinks that the quantity has somewhat increased for the past twelve months. Has been curetted for the increase with no benefit.

Examination.—Uterus apparently enlarged. Mass to the right side in the broad ligament about the size of a hen's egg, hard as a fibroid. The space between the uterus and the mass was estimated as that of fully three-quarters of an inch. Uterus freely movable and nodular. I advised the removal of the growths on the ground of pressure symptoms. She was seen by an eminent consultant, who inclined to a sarcoma of the ovary and also suggested removal. She consented to operation, requesting, if possible, that the uterus be saved.

Operation revealed a multiple fibroid uterus and two discrete fibroids of the right broad ligament, one as large as a hen's egg, and a second about the size of a filbert. Each of these was readily enucleated, the hemorrhage being controlled with suture ligatures. The uterine masses were readily enucleated.

The patient was sent home in her third week. Fig. II represents a sagittal section with the uterus, and the vagina traced in the oblique shading of the tumor.

UTERINE FIBROMATA COMPLICATING PREGNANCY.

BY

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THOUGH our knowledge of uterine fibroids has during later years greatly increased and their surgical treatment in uncomplicated cases is now about all that can be desired, owing to the careful, conscientious clinical and pathological work of many laborers in this field, there yet remain various conditions which they complicate, the treatment of which is not yet fully worked out, one of the most important of these being pregnancy. At present we have no great data by which to be guided as to the best method of dealing with this complication, though within recent years reports of cases are more frequently appearing in the literature.

It is, of course, well understood that a large proportion of women having fibroids remain sterile. Hofmeier(1)says 25 per cent., Olshausen(2) 30 per cent.; while statistics collected by Noble(3) would indicate a larger number; and that when pregnancy does occur in a fibroid uterus, the increased dangers encountered over those of the normal condition are many; obstruction to labor, sloughing of the growth and abscess of it, malpositions of fetus, prolapse of cord, placenta previa, abortion, ectopic gestation, postpartum hemorrhages, rupture of the uterus due to weakness of the uterine wall by reason of the presence of the fibroid, internal hemorrhages, excessive vomiting, intestinal obstruction, excessive abdominal pain, "threatening symptoms referable to heart and lungs," dangerous pressure on ureters, and rapid emaciation, present a formidable array, and should invite our most serious consideration. Of the nineteen cases of pregnancy reported by Noble(3) in his statistics of fibroids, six, or 30 per cent., were ectopic, which would indicate the extreme frequency of this condition in their presence. He says that small subserous fibroids frequently prevent conception by displacement of the adnexa.

The location of the growth in the uterine wall, according to Montgomery(4), determines the possibility of pregnancy, "the submucous or interstitial variety increasing the disposition to sterility by reason of the accompanying endometritis; while the growths that do not especially encroach on the uterine cavity, as the subperitoneal, should not, and usually do not interfere with conception." That fibroids predispose to abortion seems to be the opinion of many observers; but the same author says, "a study of the statistics of pregnancy does not seem to show an increase of the frequency of such interruption over what is found to occur in uncomplicated pregnancy." That abortion is, however, more frequent in the presence of fibroids is borne out by the observations of others, especially Pinto(5), who found that when the placenta is so situated that it lies directly upon the fibroid, its nutrition is so interfered with that it atrophies, when abortion is likely to occur.

In view of the dangers encountered, a number of progressive surgeons have within recent years seriously advised and carried out prophylactic and curative operations in conditions of fibroids complicating pregnancy, and now a sufficient number have proved successful to demonstrate their life-saving value for both mother and child. Myomectomy in the unimpregnated uterus, in certain selected cases, has now become a well-recognized procedure. Though not within the scope of this paper to consider, I may say, in passing, that many have been performed with subsequent pregnancies; and its success may be estimated by the fact that I have only been able to find one case reported, and that observed by Professor Duhrssen(6), in which trouble had ensued by reason of the operation. This was a case of rupture of the uterus through the old scar during labor. I must acknowledge, however, that I have examined the literature only over the last five years and that somewhat superficially.

The curative operations employed have been the radical hysterectomy and the conservative myomectomy: the latter done either by way of the vagina or abdomen. This paper deals alone with the abdominal route. Operations also have been done for raising and fixing the tumor and uterus outside of the pelvis and within the abdominal cavity, so that their enlargement as pregnancy proceeds is not interfered with. The considerations which have led surgeons to operate have been continuous pain over the abdomen, severe pressure symptoms on vital organs produced by the growing uterus and tumor, mani-

fest obstruction to the pelvic outlet sufficient to seriously interfere with the delivery of the child, evidence that abortion or premature labor is impending, excessive vomiting, interference by the tumor with the upward extension of the uterus, inflammatory and strangulatory complications, necrotic changes in the tumor with sepsis due to twisted pedicle, and rupture of the uterus.

In the absence of some one or more of these indications, interference by operation would hardly be warranted, for many cases, even when the tumor has been of large size, have been delivered without trouble, and the entire process of parturition normally concluded. The production of abortion in this condition is generally considered to be accompanied by grave danger and, aside from ethical reasons, should but rarely be considered as the low vitality of the growth predisposes to sepsis and its presence in the wall by interfering with uterine contractions causes hemorrhage.

When operation is decided upon, it becomes at once a grave question as to its character, and especially to determine whether myomectomy or hysterectomy should be done. This often can only be decided after the abdomen is opened. Myomectomy must be based upon the location of the tumor in the uterine wall, its size and the period of pregnancy. It is held by many well fitted to judge that myomectomy is only permissible prior to the fifth month, but I note that Mann(7), with complete success, removed a large fibroid at the end of the sixth month. I have not been able to find anywhere recorded a case of myomectomy done successfully later than this. With reference to the location, Dr. Boldt(8) would confine operation to subperitoneal and pedunculated tumors, and Doran(9) to such as are situated below the brim of the pelvis; while Bonifield(10) says it should be limited to those cases in which the fibroids are not numerous and in which they can be easily enucleated.

Montgomery(11), at the meeting of the American Medical Association in 1906, reported three cases in which the tumors were interstitial, and in one "at least two-thirds of the uterine wall was entered," the cases all going on to term and being delivered normally. In one of these the tumor, after enucleation, measured four by five inches in diameter. Carstens(12) reports another interstitially situated, successfully removed, which measured two by five inches in diameter. In fact, a number of cases are now recorded in which interstitial growths have been re-

moved without interfering at all with the progress of pregnancy and parturition, as have also multiple tumors. With reference to size, the largest I have found recorded weighed eight pounds, reported by Miles F. Porter(13), of Fort Wayne; in this instance also the child was carried to term and born without any trouble. Whether interstitial or subperitoneal, his report does not say, but it is safe to assume that it was subperitoneal. Another, reported by Mischnow(14), was the size of a child's head, pregnancy at five months, delivery at term being normal.

The following case also illustrates that the removal of an interstitial growth is not necessarily followed by an interruption of pregnancy, and that this operation may be of value in dealing with an otherwise uncontrollable vomiting.

CASE I.—Mrs. H., referred to me by Dr. D. E. Haag, of Liberty Center, O., age thirty-three, the subject of a hip-joint disease, has menstruated very freely for a number of years. Was admitted to Robinwood Hospital in Toledo, March 24, 1908, pregnant three months. Has an interstitial fibroid size of a small orange in anterior wall of uterus, in lower and middle segment, so located that it is giving much concern as to its effect upon the progress and delivery. Vomiting is frequent and uncontrollable, giving rise to much distress. March 26, 1908, I operated, removing the tumor by enucleation. It was deeply interstitial. The incision in the uterine wall was carefully sutured in layers with ordinary catgut. Hemorrhage was not sufficiently profuse to occasion concern, the sutures controlling it without difficulty. Recovery was prompt and uneventful, except that on the third or fourth day uterine contraction began, with some discharge of blood. The pains were controlled by morphia, and after a week or so the bloody discharge ceased. The severe vomiting almost immediately came to an end, though slight nausea continued. So far as can be determined, the operation did not in any way interfere with the progress of her pregnancy.

Dr. McMurtry(15), in a paper read before the Southern Surgical and Gynecological Association, says, "Small tumors in any part of the uterus very rarely interfere with pregnancy or labor." While without doubt this proposition is true, yet the importance of these small growths must not be underestimated. In an instance recently occurring in my own practice, in which I operated on an eleven months' case of extrauterine gestation, the child presumably dying soon after full term, a small fibroid, no larger than a good-sized hickory nut, was found imbedded within the uterine

wall, just below the exit of the Fallopian tube and evidently interfering with its lumen and function. I am quite convinced that its presence constituted the chief etiologic factor of the trouble. Other small fibroids, none of them larger, were distributed through the body of the uterus.

A brief report of the case is as follows:

CASE II.—Mrs. K., referred to me by Dr. Calvin Chollette, of Toledo, O., was admitted to Robinwood Hospital, in Toledo, August 9, 1908. She had had one child thirteen years ago; no history of pelvic peritonitis; no miscarriages or severe pain which might indicate a ruptured tube; was quite regular as to menstruation until ten or eleven months ago, when it ceased and did not reappear until two weeks prior to operation, when there was a slight flow. She had first noticed an enlargement of the abdomen seven months prior to my examination. It now extends two inches above the umbilicus. It has slowly diminished in size during the past two months. When she ceased menstruating she had thought herself pregnant. Eight weeks prior to admission, she began to have chills lasting for an hour at a time. Former weight, 165; present weight, 115 pounds. Pulse 90, temperature varying from normal to 102.

I operated August 11, 1908, removing with some difficulty the fetus with its inclosing sac. The sac was strongly adherent to the intestines and pelvic viscera. The uterus was found to be but little enlarged, though its wall contained a few small fibroids, the largest of which, the size of a shelled hickory nut, was enucleated from the right horn of the uterus below the exit of the Fallopian tube, in which the pregnancy had evidently occurred.

From time to time cases have been reported in which the abdomen has been opened by reason of symptoms produced by the impaction of a fibroid in the pelvis; and when the uterus and tumor were lifted into the general cavity, relief from them followed. Two such cases have occurred in my own practice. In one a living child was born at term without trouble; in the other, forceps were employed and a dead child delivered, the mother recovering with difficulty. An examination of the first case a few months after revealed the fact that her fibroid had almost entirely disappeared—the only instance of the practical disappearance of such tumor coming under my own observation, though a number have been observed by others and care-

fully noted. Doran(16) has collected thirteen cases in which the tumor had disappeared.

The question as to whether fibroids may be removed with safety during the progress of labor and the uterus conserved, is one of a good deal of interest. In a case of Porro Cesarean operation which I performed, after the patient had been in labor for sixty hours, in which the tumor was as large as a fetal head, attached to the uterus near the fundus by a pedicle about two inches in diameter, it seemed to me upon examination of the specimen afterward, that it alone might have been removed at the time and the uterus saved. The case was reported in the *Medical Record* for July, 1900.

The points I wish to note in this paper are, that in the presence of a pregnancy,

1. Should operations for the removal of fibroids be limited to the fifth month, and if not and limited to any time, what should that time be ?

2. That not only pedunculated and subperitoneal tumors may be removed, but interstitial as well, without interruption of pregnancy.

3. That even very small fibroids may be so situated as to become of lethal significance.

4. That fibroid tumors may practically disappear at this time or shortly subsequent to it.

5. The possibility of the removal of pedunculated fibroids during labor, allowing it to progress naturally.

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MYOMA OF THE CERVIX UTERI.

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St. Louis.

(With three illustrations.)

OPERATIONS for the removal of uterine fibroids, irrespective of their location, always command the most serious consideration. Our diagnosis has occasionally led us unexpectedly into the gravest surgical work, because of an error in not properly determining the relationship of the tumor mass to the uterus. Then again, gratifying surprises have illumined the operative field as the progress of the work showed that in expectation of a severe task, one of a mild nature had been encountered.

Fibroid tumors of the cervix are very much less frequent than those of the body of the uterus. The cervical tumors that I have seen in the practice of my colleagues I can readily recall. In my own practice I have had but four. The fibroid tumors of the cervix uteri I refer to were good-sized masses filling the vagina and, unlike the smaller fibroid tumors, such as a pedunculated fibroid polypus, simply protruding into the vaginal canal. A tumor originating in the cervix presents the same characteristics as one found in the body of the uterus. In the extravaginal cervix the varieties may be of a submucous, interstitial or subperitoneal nature, while in the intravaginal portion these tumors obviously must be either interstitial or submucous.

The tendency of a cervical tumor is to grow downward into the vagina. Ordinarily it can be differentiated without much difficulty from an inversion of the uterus, a condition that sometimes invites diagnostic difficulties. Rarely do these tumors attain a large size, and this is fortunate, because their removal by enucleation and traction through the vagina is the proper procedure. The disturbance of the normal topographical relations caused by the growth of such a tumor often makes it difficult to place its origin. This is the crucial point to be considered, for upon it will depend a successful removal.

Some tumors of the cervix are more favorably situated than others; enucleation then may be an easy procedure. In two

cases under my care I cannot say that I had the good fortune of an easy enucleation. It was only after the most trying work supplemented by the application of a pair of obstetric forceps, that it became possible to drag the tumor down sufficiently and relieve its firm upper attachments, which were beyond the reach of my finger. The method in the use of the forceps as applied to tumors in the vaginal canal is precisely the same as in an obstetrical case. The tumor is delivered like the

FIG. 1.—Diagram showing tumor in situ.

head of a child and I may say that in these two cases the extraction of a full-grown fetal head would have been a less trying task than the delivery of these tumors. In both cases the tumor mass was as large as a child's head, but its compressibility was very much less.

The traumatism to the vaginal canal in one of these cases was of so severe a nature, that I wish to remark about it. After the removal of the tumor the vaginal canal presented really

an appalling appearance. From the enormous distention that the vaginal walls suffered (this patient was a virgin), the attachment of the vagina to the descending ramus of the pubis on either side had been completely severed, so that practically the whole posterior and lateral walls of the vagina were floating loosely in the wound. Restoration was difficult; however, I succeeded in uniting all the torn surfaces with suture, bringing the ap-

FIG. 2.—Fibroid tumor of cervix uteri.

pearance of the parts as closely to their normal state as was possible. This patient made an excellent recovery.

Of the difficulties encountered in the removal of such tumors I may make mention of the third case. The tumor mass presented such an unusual hardness that it was extremely difficult to start the operation. The growth was protruding between the labia and its size was such that it filled the whole vagina, making it impossible to peel the capsule away from the tumor. With the aid of a sharp spoon (Fig. 3) I began to excavate the growth

about its center till I was able to make sufficient room to work between capsule and tumor. Frequent recourse to this method of morcellement facilitated its removal, which was accomplished without accident.

The specimen which I beg to present on account of the interesting features attached to it was removed from an unmarried woman about thirty-two years of age. Seven years ago an attempt was made to remove this tumor. At that time it was large enough to fill the greater part of the vagina. Eliminating the gloom it

FIG. 3.—Sharp spoon for excochleation.

cast over the life of this young woman and an occasional hemorrhage, this growth was the cause of little discomfort to her. The attempt at removal was abandoned, the surgeon pronouncing it too hazardous an undertaking. Both ovaries and tubes, however, were removed under the promise that improvement would follow. The promise made for this radical operation was in part realized. Menstruation promptly ceased, the hemorrhages were arrested and it was thought for a time that the tumor was contracting.

For five years the life of this woman was a fairly comfortable one. Then severe backaches set in, urination became difficult and the vaginal discharges became annoying. For the following two years a life of increasing discomfort was tolerated, when a severe rectal distress manifested itself, which caused her to again sum up sufficient courage to ask for the removal of the growth. Examination, rendered difficult by the narrowness of the vaginal introitus, showed the vagina and the whole true pelvic cavity filled by a large, hard, immovable mass. I was not able to demonstrate the external os, but by the shape of the tumor I inferred that it must be behind and above the symphysis.

Bimanual palpation revealed a small rounded body above the symphysis pubis, which was interpreted to be the fundus of the uterus. On either side it was impossible for me, *per vaginam*, to determine the extent of the attachments of the tumor. The diagnosis of fibroid tumor, situated in the posterior portion of the cervix of the uterus and growing into the pelvis between the layers of the broad ligament, was made. If I do not err, tumors growing below the posterior pelvic peritoneum are very rare. It was not difficult to recognize the formidable position of the growth, neither was the task of its removal underestimated.

Although conditions looked inviting for its removal by enucleation per vaginam, I was deterred from pursuing that course by the previous laparotomy, fearing the resulting adhesions that I expected to meet. During the progress of the operation this anticipation was strongly realized, and I could not help but feel a keen sense of appreciation for my colleague's prognostic skill. The preliminary inspection after the abdominal cavity had been opened presaged a rather discouraging outlook. Here was the bladder high up in the abdomen, evidently glad at its escape from injury, for I came within a hair's breadth of cutting into it. This viscus was a source of much annoyance, it being in the way almost constantly. There was no room, no place where it could be tucked safely away.

The obliteration of Douglas's culdesac by the growth caused the sigmoid flexure to be raised out of its normal bed. It was spread out flat over the greater portion of the tumor and was closely adherent to it. The severing of these adhesions was accomplished with considerable difficulty, and although the ovarian vessels had been secured at the time of the oöphorectomy, the bleeding was profuse and troublesome. It was at this stage of the opera-

tion that the greatest relief was experienced in not having attempted the removal of the tumor through the vaginal canal. After having freed the sigmoid and some dense omental adhesions, I experienced little difficulty in working through the pelvic peritoneum near the brim of the pelvis, and in this manner freeing the tumor from the rectum. By keeping close to the mass and using considerable tractile force during the enucleation, I was able to overcome to a certain extent the unpleasant sensation constantly before me of an injury to a ureter. On account of the wedged-in condition of the tumor mass in the pelvis, the work was trying.

However, after the technical difficulties had been overcome and the enucleation had been started and was fairly well under way, it was accomplished with surprising ease. The tumor was being released very much in the same manner as a finger would be withdrawn from a tight-fitting glove. The bladder attachment offered no obstacle. It was readily separated from the tumor. This was done by gentle rubbing with a gauze sponge, out of respect to the ureters. Posteriorly the peritoneal reflection from the rectum upon the tumor necessitated cutting. The remaining attachment was to the vaginal canal and this was severed, completely releasing the growth. There was little bleeding at the bottom of the wound. Peritoneal approximation as good as conditions would permit with vaginal drainage constituted the closing steps of the operation.

It was interesting to note the pressure atrophy that both vagina and rectum suffered. The walls of these organs seemed as thin as tissue-paper. This patient had a stormy convalescence induced by an infection from the vagina. I was very apprehensive of just such a happening. It was almost impossible to subject the vaginal canal to a thorough cleansing. This is one reason, and one that will carry much weight, why tumors growing into the vaginal canal should be removed through this channel. Injury to the pelvic cellular tissue or to the peritoneum can then be avoided and the only traumatism of any consequence will be the laceration of the vagina and the perineum, and that often may be considerable.

DISCUSSION ON THE PAPERS OF DRS. ERDMANN, GILLETTE, AND REDER.

Dr. Henry Schwarz, St. Louis.—I was very much interested in all of the papers, and wish to say that fibromyomas of the uterus show themselves in such various aspects that each case must be considered a law unto itself. I do not believe we can lay down any iron-clad rule by which we can handle every case that may occur. No matter how large one's experience is, in every case of fibromyoma of the uterus one feels that he meets with something which is altogether different from anything he has seen before.

Dr. Erdmann's cases interested me very much, and while I admit that fibromyoma originating in the broad ligament occurs, because now and then we find small fibromyomas a great distance from the uterus and enucleate them, yet I believe in his cases most likely the tumors originated like all fibromyomas of the uterus—namely, as interstitial fibromyomas, gradually working their way either toward one surface or the other, and, as you know, the submucous variety will become detached and give spontaneous birth to a fibrous polyp, while the subserous variety will become detached and form new connections in the abdomen, and so will the variety which works its way between the broad ligament and in the course of time becomes fully detached. When we find tumors of the size he has reported, it is a matter open to discussion as to whether they originally developed in the broad ligament or whether they were interstitial fibroids that are developed along well-known lines.

Dr. Gillette, I think, should be congratulated upon the selection of cases he has reported. I have often been puzzled in recognizing fibroids when they complicated pregnancy. What I mean is this: it is well-known that fibroid tumors undergo softening during pregnancy; they sometimes become so soft that they simulate fluctuation to a nicety, so that to discriminate between a cyst and a solid tumor is in some cases impossible. Let me illustrate what I mean: In February, 1882, a case was brought into the Lying-in Hospital at Heidelberg with a fluctuating tumor filling the pelvic cavity. Attempts at version had been made unsuccessfully. We followed the rule of putting the woman in the knee-elbow position, and tried to push the tumor up, without success. We next tried to introduce a trocar into the tumor and withdraw the fluid, but in the meantime the child had died and craniotomy was performed. After delivery the case appeared to be a very simple one. On the left side of the uterus was a mass that distinctly fluctuated. It was clearly a case of cyst of the broad ligament. The woman died two weeks or so after delivery from exhaustion, and at the post-mortem Professor Kehrer wanted to see how far he could have removed the obstruction with a trocar, but no fluid came. The

tumor and uterus were taken out by Professor Arnold The professor held up the tumor, cut it open, but no fluid escaped. The tumor was a soft fibroid, highly vascular.

As to our action in cases of fibroid tumors complicating pregnancy, I agree with Dr. Gillette that we cannot treat all cases alike. If the tumor is likely to cause obstruction at the time of delivery, the patient should be operated on. If the tumor is of medium size and is not likely to cause obstruction, I think it is well to let it go, because it is remarkable to see what large tumors sometimes undergo involution after delivery. I remember two such cases in which tumors larger than my fist entirely disappeared after delivery. I had accidentally three cases year before last of women, all about four months pregnant, who presented themselves with fibroid tumors. In one of them the tumor was wedged in below the promontory. It was an interstitial tumor. I took it out. She made an uneventful recovery, and was delivered at term. In the second case I advised waiting. This woman had a miscarriage at about six months, and in the course of involution the tumor disappeared entirely. As to the third case, the woman did not live in St. Louis. She was delivered in Chicago under great difficulties, but returned to St. Louis later on and had the tumor removed.

These cases illustrate that not all of them should be treated alike. We should always, if possible, wait and see what Nature will do for them, provided the tumors do not seem likely to cause any serious impediment or obstruction at the time of delivery.

Dr. Daniel H. Craig, Boston.—With regard to the question of operating on fibroids complicating pregnancy, the possibility of involution of these tumors after the termination o pregnancy has arisen. But there is another question which I think should govern in our decision as to whether we should operate for the removal of these tumors or not—namely, their ability to bring about complications after the time of delivery.

A number of cases have been reported by Dr. Reynolds or by Dr. Graves—I don't remember which—in which the fibroid diminished *pari passu* with the involution of the uterus up to a certain point and then, with a sudden diminution in the blood supply, this was carried beyond the point of ordinary involution; hence there was actual necrosis of the fibroid or fibroids, bringing about a decidedly serious condition. This possibility should always be borne in mind in the consideration of fibroids complicating pregnancy. Al hough these cases are rare, just as cases of complete or sufficient involution after childbirth are not particularly common, it seems to me one additional argument for surgical intervention if there is the slightest room for doubt as to whether a fibroid is going to create trouble at the time of delivery or not.

Dr. Charles L. Bonifield, Cincinnati.—Unfortunately, I did not hear the paper of Dr. Erdmann, which I regret exceedingly, as I have had some experience in operating on intraliga-

mentous fibroids of large size. One case I reported last year in discussing this subject before this Association, in wh ch the tumor was complicated with pregnancy, and the uterus as it enlarged made such firm pressure on the bloodvessels :n the pelvis that it obstructed the venous flow of blood from the right leg, so that when I saw the patient her leg was swollen to twice the natural size. The cervix could not be felt, and the only means of knowing the patient was pregnant was from the history which she gave, and her family physician told me that earlier he had elicited manifestations of pregnancy.

In my opinion the best way to operate on the majority of these cases is by supravaginal hysterectomy, commencing on the side of the uterus to which the growth is not attached. Securing the ovarian and uterine arteries on this side, then the ovarian artery on the side where the tumor is, i possible the uterine artery on the tumor side, but often this will be impossible and the cervix will have to be cut through before the uterine artery is secured, as advised by Kelly, otherwise the hemorrhage is likely to be very pro use.

The subject of fibroids complicating pregnancy is one of exceeding interest. Last year, in discussing the subject, I referred to a paper which I read before the Ohio State Medical Association two or three years ago, in which I reported seven or eight cases. There are two or three points worthy of discussion. In the first place, it is usually stated that fibroids are a pretty strong means of preventing pregnancy. It is a question in my mind whether that is true or not, unless the fibroid is submucous and produces a good deal of endometritis. It is a well-known fact that the majority of women who have fibroid tumors are sterile before they get these tumors, and it is a question whether sterility has to do with the production of fibroids or whether the fibroid or fibroids produce sterility.

I never operated on but one patient whom I thought was pregnant, where I removed the tumor, and left the pregnancy without interruption. This woman got along nicely. She was in the fifth month of pregnancy when the tumor was removed. The tumor was of considerable size, and attached to the anterior wall of the uterus by a comparatively small pedicle. It was easily enucleated. There is no reason why one should not remove several tumors, if necessary, provided they are not too deeply imbedded in the uterus. If we have a number of tumors that are deeply embedded in the walls of the uterus, it is too much to expect that labor will not be interrupted. Even if it should not be, there is some danger to my mind that the scar may give rise to trouble at the time of delivery.

I think the paper of Dr. Gillette is very interesting, and the specimen he has exhibited is certainly very instructive.

Dr. Craig brought up the point with reference to these tumors undergoing involution after pregnancy. I think this sometimes occurs, and the case Dr. Craig speaks of is well taken, but in

my experience the shrinkage of these tumors after pregnancy is not commensurate with the growth that has taken place during pregnancy. Some years ago I did a Cesarean section because a fibroid so obstructed the pelvis that labor was impossible, and it seemed at the time it would be hard to remove the tumor, hence I left it, hoping involution might cause it to shrink; but in six or eight months the tumor, instead of having decreased, had increased in size. I was summoned to operate on the woman because she was absolutely unable to empty the bladder. The tumor had grown while involution was taking place. While I have heard and read and believed that it occasionally happens that the size of fibroid tumor decreases after pregnancy, I have not observed it.

Dr. E. Gustav Zinke, Cincinnati.—Permit me to relate my experience with a case of fibroid tumors complicating pregnancy. About three years ago I was consulted by a woman who had multiple uterine fibroids. These were so large and numerous that the uppermost tumor was on a level with the umbilicus. Operation was advised, but declined. She was comparatively comfortable did not complain of anything except a sense of heaviness. She then became a childless widow, having been married twenty years at the time her husband died. After two years she married again. About six weeks after her marriage I was consulted by her, and the tumor showed distinct and rapid enlargement, extending two inches above the umbilicus. She complained of severe pressure symptoms. She was now forty-eight years of age, and, thinking she was in the menopause, and as sterility is usually associated with the existence of these tumors, I never thought of the possiblity of her being pregnant, but attributed the absence of menstruation rather to the beginning of the menopause. Hysterectomy was recommended as the symptoms had increased in severity, and she accepted the proposition. She had eleven fibroids—intramural, submucous, and subperitoneal. After the operation we cut open the tumor and found a three months' fetus in the uterine cavity.

As to the disappearance of fibroid tumors after pregnancy during the process of involution, I have known for years, from my reading, that some of these tumors have a tendency to disappear completely during the process of involution, though I have never seen its occurrence.

Dr. Gillette (closing the discussion).—I want to emphasize what I said in my paper as to the value of doing myomectomy in the presence of pregnancy. No man can know before the abdomen is opened whether a hysterectomy will have to be done or not, hence should be prepared for it. The life of the child should be saved, if possible. These cases, as Dr. Schwarz suggested in his remarks, had probably best be sent to a hospital and watched, and if it is found there is necessity for immediate intervention, the patient can then be better operated upon. That is the proper course to pursue.

With reference to the disappearance of fibroid tumors, as I stated in my paper, I would not attempt to say that in the case mentioned the tumor disappeared entirely, but so far as I am able to determine it has done so. It is the only one I have ever seen that has undergone retrograde change, and I have kept track of a number after pregnancies.

I was much interested in what Dr. Schwarz said with reference to the softening of fibroids during the time of pregnancy. In those cases that have come under my observation and those which I have operated on, the tumors have not been soft. The tumor passed around the room is harder than the ordinary fibroid we meet with. The small fibroid is equally hard. There is no softening. The fibroids I have enucleated in the presence of other pregnancies have also been of equal hardness, and the query arises in my mind as to whether it is not the uterus that is softened in the cases mentioned by Dr. Schwarz and then taken for the fibroid itself.

OVARIOTOMY DURING PREGNANCY.

BY

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DURING the past ten years I have had occasion to interfere for ovarian cystomata during pregnancy five times, and it occurred to me that a paper on the subject might not be out of place at the present time.

The first case was a cyst the size of a fetal head at term and proved to be a dermoid, which must of necessity have been present for a considerable length of time, but had never been discovered until the patient was pregnant for the fourth time. M. M., thirty-seven years of age, had given birth to three healthy children, all the labors having been easy, requiring no instrumentation. The last child was born three and a half years ago. When seen in consultation the patient was about nine weeks pregnant and complained of severe pains in the back and abdomen. By examination a right-sided, movable cyst was easily made out. Laparotomy revealed a dermoid, which contained hair and fat. Forty-eight hours after the operation labor pains of a mild character commenced, but were controlled by rectal enema of chloral and ammonium bromide in large doses. They disappeared completely at the end of forty-eight hours, and the patient went to term, being delivered of an eight-pound girl.

If the symptoms, which cause the patient to consult a physician, are considered, one will usually find that they consist of abdominal pain and backache, coming on rather suddenly and from no evident cause. Most of these patients feel relatively well until the tumor gives rise to pain. In my second case the symptoms were so severe that one might almost be led to suppose that intestinal obstruction was taking place. Mrs. F. W., twenty-nine years of age, had given birth to two healthy children, the labors being uncomplicated. Six months after the last labor she aborted for no known cause at about the third month.

After the abortion the menstruation occurred four times, the last being nine weeks previous to my visit. The patient, who had always considered herself in excellent health, noticed that

her abdomen was still somewhat increased in size after the miscarriage. She then commenced to complain of very severe abdominal pain accompanied by vomiting, chills and a slight rise in temperature. The patient was carefully watched for a few days, when these rather violent symptoms subsided. Examination revealed a uterus about the size of a two months' pregnancy and lying behind it was found a cystic tumor. Operation was advised and accepted.

The walls of the cyst were somewhat adherent to the parietal peritoneum and omentum. A dark, reddish-colored fluid was let out from the cyst, after which the pedicle of the tumor was examined and found twisted on its axis twice. It was full of ecchymotic spots. The after-progress of the case was perfectly satisfactory and at no time was there any evidence of a commencing miscarriage. She was delivered spontaneously at term.

In the following case the patient had been cognizant of a gradual enlargement of the abdomen for a number of months, but as there had been no symptoms, no medical advice had been sought when on account of sudden intraabdominal pain, I was asked to see the case. The symptoms presented were certainly peculiar; in a very short time prolapsus had occurred, and for a fortnight before seeing the patient, there had been considerable disturbance in the micturition, to such an extent that, on account of the retention, the bladder had to be emptied with a catheter. The pathologic condition found at operation explains the symptoms.

Mrs. W. H. G., thirty-nine years of age, had had two normal pregnancies, the last seven years ago. The last menstruation occurred four months ago, at which time a considerable amount of blood was lost. For the past three weeks the patient has noticed the development of a prolapsus and for the last fourteen days has complained of pain in the abdomen and the sensation of severe pressure when passing urine. Three days before we saw her a catheter had to be passed on account of retention. Upon examination the cervix uteri protruded through the vulva. The corpus uteri was retroflexed and lay in the small pelvis. In direct connection with the organ was found a tumor, probably of a cystic nature, extending considerably above the umbilicus. Laparotomy revealed a cyst on the left the size of an adult head which was nowhere adherent. It had displaced the uterus to such an extent that a torsion of the organ had resulted in the supravaginal region. The torsion

was about 140°. After the cyst was removed the uterus was readily straightened and brought into normal position. The ultimate outcome of the case was satisfactory and an examination made one week after the operation showed the uterus in its normal position. The patient went to term and had a normal labor.

According to Jetter's statistics, there were thirty-one dermoids out of a total of 105 instances of ovarian tumors occurring during pregnancy. This would make 19 per cent. of dermoids when, generally speaking, relationship of dermoids to other ovarian cystomata is about 4 per cent. Stauda explains this frequency of dermoids, as found during pregnancy compared to other cystomata, from the fact that their growth is slow and gives rise to few symptoms, so that the patients do not come under medical observation, whereas in other more rapidly growing cysts, they come under treatment much earlier and are operated on when no pregnancy is present. Martin also believes that dermoids, owing to their pelvic situation, are less likely to be discovered than the more superficially situated cystomata.

Generally speaking, diagnosis of ovarian growths during pregnancy can be made with ease, but in one of my cases it was only a probability, and, as will be seen, this case shows how, under some circumstances, the diagnosis may be far from easy, because, in spite of the fact that the pregnancy had reached nearly the sixth month, it was impossible to palpate the uterus on account of the very large size of the neoplasm. It is possible that under narcosis I might have been more successful, but, as operation was indicated, it was considered needless to submit the woman to more than one etherization.

Mrs. H. F. C., thirty-two years of age, married seven years, had never been pregnant. The menstruation had always been regular and painless, but has been absent for five months. For about two years the patient has noticed a gradual increase in the size of her abdomen, although she has never suffered. Ten days before coming under observation, she was suddenly taken with very acute pains in the abdomen and these have steadily increased. The abdomen is enormously enlarged, and when the patient is in the erect position it sags forward. Percussion gives a clear note all over the abdomen, excepting in the left hypochondrium where a tympanitic note can be elicited. A distinct fluctuation could be made out. The bases of both lungs were pushed upward. The vaginal mucosa and cervix are of a dark blue color and extremely lax. The anterior and

posterior vaginal culsdesac are prolapsed, and distinct fluctuation can be detected in the posterior culdesac. The uterus and adnexa cannot be palpated. After incision of the abdominal walls a sticky fluid made its exit under high pressure, about twelve to fifteen liters being voided. After this had occurred it was found that there was no ascites, as we had at first suspected, and that the walls of the cystic growth were intimately adherent to the peritoneum. With considerable difficulty the cyst was finally peeled off, a short pedicle was found with difficulty and ligated. After the cyst had been freed, a five months' pregnant uterus came into view. Recovery was uneventful and the patient was delivered by her physician at term.

The indication for operative interference during pregnancy is usually due to the severity of the symptoms presented by the patient. These usually appear rather suddenly and indicate in many instances that some change has taken place in the growth. In the last-mentioned case the great dimensions of the growth in itself, combined with pregnancy, were enough to cause serious danger to the patient. The difficulty in micturition and the prolapse in my third case would also have led to serious complications, even if the uterus had not undergone torsion. According to Martin, only two instances of cases of ovarian tumor complicating pregnancy are known in which hyperemesis was the principal symptom and indicated operative interference. One of these cases, which was recorded by Atlee, died in spite of removal of the growth thirty days after the operation from exhaustion, while the second patient, who was under the care of Mangiagalli, continued to vomit after ovariotomy had been done, so that he was obliged to empty the uterus, this resulting in recovery. Now, while in both of these cases, removal of the cyst had no influence upon the hyperemesis, I saw in consultation one case occurring in the practice of another surgeon where vomiting stopped after the interference and pregnancy continued to term.

In my fifth case I removed the cyst by posterior colpotomy, and, although much has been said about the dangers connected with this operation when undertaken during pregnancy, it will be seen that, at least in this case, no difficulties presented themselves. It has been upheld that the vaginal route is more apt to give rise to interruption of pregnancy than abdominal incision, because more manipulation is required for the removal of the growth, and consequently more direct irritation is caused to the

lower uterine segment, but in my case the growth was very movable, about the size of a large orange and laid directly in the small pelvis; consequently, it seemed rather more proper to remove it per vaginam. What we particularly noted was that excessive bleeding of the vaginal incision did not occur. The history of the case is briefly as follows:

Mrs. M. W., thirty-four years of age, had been previously delivered of two healthy children. For the last three years her menses had been irregular, sometimes occurring every three weeks, at others every five or six. The last menstruation was four months ago. For several weeks she has complained of rather sharp pain in the right side. Upon examination the uterus was found enlarged, corresponding to a pregnant uterus between the third and fourth month. Behind it and somewhat to the left a movable elastic tumor could be detected. Posterior colpotomy. Upon incision of the vaginal vault no marked hemorrhage was encountered. Upon opening the abdominal cavity a cystic tumor presented itself directly into the vaginal wound. Pushing the uterus to the side, the growth was easily brought down and its pedicle clamped. During this maneuver the cyst was ruptured, its contents proving that is was a dermoid. The pedicle was easily ligated and the cyst removed. The pedicle was reduced into the abdominal cavity and the colpotomy incision closed; recovery was uneventful, the patient going to term and being delivered without complications.

As to the frequency of miscarriage occurring after abdominal or vaginal operations, I am unable to find any statistics of value, but, generally speaking, it would seem that, at least in the case of ovarian cystomata, this unfortunale occurrence is not frequent. Circulatory disturbances following operation have been accused as the cause for interruption of pregnancy, and these may naturally occur whether the cyst is removed by abdominal incision or *per vaginam*. At the present time I believe it may be said that ovariotomy during pregnancy is a justifiable procedure and should always be resorted to when indications present. It is evident that colpotomy is a simpler operation, and in my opinion, when the existing conditions are such that it can be undertaken, it is preferable to abdominal incision.

There is no doubt whatever but that the severity of the operation, the length of time consumed and so forth, influence the pregnancy, and another most important factor in the production of miscarriage is, to our way of thinking, a cooling of the

abdominal organs and peritoneal cavity during laparotomy. If we are correct in this supposition, then posterior or anterior colpotomy should be selected when possible. When the cyst is small and located in the small pelvis, and if it is movable, removal *per vaginam* seems proper, because there is less intra-abdominal manipulation.

Of the complications found during operation, I would call particular attention to torsion of the pedicle and, whether this occurs during pregnancy or not, the symptoms to which it gives rise may simulate acute or chronic intestinal obstruction or appendicitis. In my second case the violent symptoms presented by the patient were undoubtedly due to the torsion of the pedicle. From reported cases, adhesion of the tumor with the neighboring organs, the omentum or intestine, is not uncommon, and in one of my cases these united the growth so firmly to the parietal peritoneum that the tumor ruptured before it was first noticed. Marked displacement of a pregnant uterus is also common in these cases and torsion of the organ may occur. The greatly elongated prolapsed cervix in this case may, in all probability, be accounted as a result of edema of the cervix, due to shutting off of the vascular supply and the prompt recovery of this symptom after operation would seem to favor this theory.

Pregnancy complicated by ovarian growths has been considered rather infrequent when one considers the great frequency of ovarian tumors. This rarity has been accounted for by the fact that women having pathologic changes in the ovaries generally conceive less readily. Now, although without any doubt this may be quite correct, that the diseased ovaries are the cause of sterility, still, as a matter of fact, numerous cases have been recorded in which, in spite of advanced degeneration of both glands, pregnancy nevertheless occurred. The fact that in such cases conception did take place simply goes to show that a portion of healthy ovarian tissue is sufficient for the occurrence of normal ovulation. I have had one case, where, on account of cystic changes in both ovaries the patient, having been married for a number of years, had never been pregnant and had been a great sufferer. I removed one ovary and resected two-thirds of the other, with the result that a few months after operation, she became pregnant and was delivered at term of a robust child.

Personally, I am of the opinion that cystomata complicating pregnancy is much more frequent than has been generally ad-

mitted because it must be that very many cases where there is pregnancy complicated by an ovarian tumor, do not come under surgical observation for the simple reason that no symptoms arise. Then, again, we all know that an accidental discovery of an ovarian tumor during pregnancy, labor or the puerperium is often made, the case having run a symptomless course. Furthermore, among patients who are operated on for ovarian growths those who have been sterile are far from representing the majority, and I believe that, in going over statistics, one will usually find that they are multiparous in a large proportion, so that it may be assumed correctly that the growth existed during the patient's last pregnancy. Reamy, out of 257 cases of ovarian growths, found that there were 321 pregnancies and 266 normal labors. Reports from obstetric clinics show beyond doubt that small ovarian growths frequently remain undiscovered if no definite symptoms are present causing an examination of the patient to be made. I would point out what seems to me a rather astonishing statement, viz., that out of 17,832 labors taking place in the Obstetrical Clinic of Berlin, only twenty were complicated with ovarian growths. Dohrn believes that pregnancy complicated with ovarian tumors may be placed at 4 per cent., while Williams has stated that such growths are observed relatively less frequently in married than in single women. This peculiar relationship may possibly be explained by the fact that unmarried primiparæ are examined much more frequently during pregnancy or labor, because they represent the largest contingent of public obstetrical clinics.

From what has been said, it becomes evident that, even with the presence of an ovarian tumor, pregnancy, labor and the puerperium may give rise to no disturbances and a large number of cases have been reported in which, in spite of certain complications, the patient has had a normal labor without surgical interference. In the majority of these cases, it is probable that the growth was of a benign nature and of slow development, in which instance it is likely that the tumor was a dermoid. For all that, it should not be said that the prognosis is good, generally speaking, although so many favorable cases have been reported, and in every instance where an ovarian tumor is found accidentally during pregnancy, labor or the puerperium, the physician should realize that he is dealing with a serious condition of affairs which at any moment may result fatally for the patient. The interchangeable relationships between ovarian tumors and

pregnancy, labor and the puerperium are very numerous, and reference will be made to them later on.

Opinions are divided as to the influence of pregnancy on ovarian growths. Undoubtedly, if a patient the possessor of an ovarian tumor becomes pregnant, the symptoms, if already present, will become more marked. The theory put forward by Leopold and Wernich, that ovarian growths complicated by pregnancy have a tendency to undergo malignant transformation, is a much-discussed question. If this theory be correct, then, in reality, one would encounter malignant transformation in these growths during pregnancy very much more frequently than is actually the case. In point of fact, not a single instance recorded by these authors strengthens their theory, because they could not prove that the neoplasms were not originally malignant. On the other hand, I believe it is generally admitted that pregnancy influences the growth of ovarian neoplasms. The increased blood-supply to the genitalia resulting from conception should, theoretically, increase also in the tumor, which naturally would result in a more rapid growth; but other authorities believe that the increase of the vascular supply existing in the uterus and ovaries is only manifest during the first three months of pregnancy, as is shown by the development of the corpus luteum verum, and that during the remainder of the pregnancy ovarian activity ceases completely, and consequently there is no cause for an increased blood-supply to these glands. Other competent writers maintain that the blood-supply to the ovaries is less during pregnancy, because the premenstrual congestion, which, according to them, is the principal reason for the growth and development of ovarian tumors, does not take place during pregnancy. Consequently they maintain that, when ovariotomy is done during pregnancy, and an increased vascular supply and extravasated blood is found in these growths, this should not be considered as the result of an increased arterial supply, but rather the result of stasis from venous reflux. If these facts be correct, pregnancy should have a retarding influence on the growth of these tumors. A number of investigators have come to the conclusion from their own observations that, owing to the enlargement of the uterus, the resulting limitation of space would hinder further development of ovarian growths. According to this point of view, which, in reality, is of no very great importance, after the uterus becomes empty, an immediate and rapid growth of

the neoplasm would naturally be expected, and Sir Spencer Wells made the observation that ovarian tumors decreased in size during pregnancy and after labor again increased in size. Now, although the theory that ovarian tumors evince a greater tendency to increase in size after pregnancy has taken place, cannot be upheld as absolute so far as its correctness is concerned, it nevertheless remains a fact that the dangers of ovarian tumors in pregnancy are many.

In the first place, one should take into consideration the disturbances in the blood-supply which arise as a result of the particular position of the growth, with or without torsion of the pedicle. Displacements of these tumors can easily be explained by the gradual pushing up of the abdominal organs and those contained in the small pelvis by the constantly increasing size of the pregnant uterus. Löhlein after a careful study has come to the conclusion that torsion of the pedicle occurs in 8 per cent. of these cases. Aronson found torsion of the pedicle eight times in seventy-two ovariotomies performed during pregnancy, thus making 12.8 per cent., while Dsirne met with it ten times in 109 cases; in other words, 9.1 per cent. From these figures the first conclusion to be drawn is that certain writers have laid too much stress upon the enlargement and upward growth of the uterus, and that the influence of pregnancy and the placenta upon the blood-supply of the ovarian cystomata has been much overrated. On the other hand, Löhlein does not attribute much to pregnancy as far as circulatory disturbances from a twisted pedicle are concerned, but is of the opinion that, during the postpartum this complication is much more frequent. He points out that the anatomical conditions after labor are particularly favorable for the occurrence of torsion, because, in the first place, the pedicle has been greatly stretched on account of the upward growth of the corpus uteri and to this is added the sudden decrease in the abdominal contents following the emptying of the uterus and which leaves behind it relaxed abdominal walls. All these circumstances naturally allow an ovarian cyst to become very movable if the latter is not adherent nor of very large size. If, to this is added a rapid change in the location of the tumor, then torsion of the pedicle or its rupture may easily result.

It would seem evident that pregnancy, in which the change in the position of the abdominal viscera takes place gradually leads to a constant limitation in the mobility of the various abdominal viscera and the tumor, a condition of affairs not favorable

to the development of torsion. Besides, in most cases, torsion of the pedicle during pregnancy will occur so gradually if no trauma is inflicted that oftentimes it does not lead to severe symptoms, such as are enountered in a torsion suddenly taking place and giving rise to hemorrhages into the cyst. That intracystic hemorrhages giving rise to peritoneal symptoms may take place during the puerperal state without any twisting of the pedicle is a fact too well known to cause any comment here. In many of these cases the cause of the symptoms was a rupture of the pedicle which, perhaps, was overlooked at the time of the operation.

Under some circumstances torsion of the pedicle, by cutting off the blood-supply to the growth, may result in atrophy of the latter, until a blood-supply is again given it through peritoneal adhesions contracted by the tumor. A decrease in size of ovarian cystomata during pregnancy has been observed by a number of competent men. Cases in which intracystic hemorrhage has given rise to alarming symptoms have been reported a number of times. Suppuration of the cyst during pregnancy is a very serious complication, and when the growth is small and not easily detected the diagnosis is a very delicate matter and oftentimes not made until the abdominal cavity has been opened.

Just as under certain circumstances the occurrence of pregnancy may exert an unfavorable influence upon an existing ovarian tumor, so may the tumor itself influence unfavorably pregnancy, labor or the puerperium. The presence of the ovarian cyst may without any doubt produce premature labor; especially if, on account of the tumor, a retroflexion of the uterus results, or on the other hand, if, from the size of the cyst, development of the uterus is much interfered with. However, I am under the impression that perhaps too much stress has been laid to this factor, because in many cases the most peculiar displacements, of the uterus may occur and still pregnancy go to term.

I believe that it can be safely admitted that those cases in which pregnancy goes to term, in spite of the presence of an ovarian cyst, represent the majority. Frequently, the influence of the tumor on the pregnancy is merely represented by an increase of the physiological symptoms of pregnancy, a condition of affairs which causes the patient to consult a physician who then discovers the growth.

The disturbances during pregnancy may become so severe

owing to the presence of a tumor that they certainly are an indication for ovariotomy and experience also teaches that the good results of operative interference in such cases have not been exaggerated, because, very frequently, the distressing symptoms, which up to that time had failed to be relieved by proper therapeutic measures have disappeared at once after the operation. However, just how much hyperemesis is influenced psychically by the operation is difficult to ascertain.

Very large ovarian cystomata may become a source of danger, in that they tend toward the production of dyspnea, albuminuria and edema, particularly toward the end of gestation. Labor, without doubt, can proceed spontaneously without any difficulty in spite of the presence of an ovarian cyst. This is made evident from the fact that the tumor is not infrequently discovered after birth.

While large growths may sometimes cause disturbances in the uterine contraction or displacement of the uterus, with a consequent abnormal position of the child and disturbances in the placenta, small tumors may cause serious interference during labor when they directly obstruct the birth-canal and cannot be reduced. In these cases everything depends upon the possibility of reduction of the growth into the abdominal cavity. To obtain this result many methods have been advocated which, even under the most difficult circumstances, may possibly be crowned by success. If, in such cases, spontaneous rupture of the cyst occurs, there is still a certain amount of danger for the mother. The possibility of strangulation of the tumor during labor certainly should have great weight when considering the proper treatment to pursue, and also in those cases where the growth has never given rise to any symptoms and has only been discovered accidentally during pregnancy.

The puerperal stage is, generally speaking, the least affected by the presence of ovarian cystomata as long as torsion of the pedicle does not occur. Disturbances of involution are certainly quite possible and have been observed, but they are generally of slight importance if postpartum hemorrhage arising directly after labor as the result of insufficient uterine contraction is not considered here. In order to avoid the unpleasant accidents resulting from a twisted pedicle during the postpartum, absolute quiet and a well-applied abdominal binder have been recommended.

Regarding the diagnosis, it may be said that, differentially, errors are most likely to occur when a very large cyst exists with a pregnancy in its early stages, especially when absence of menstruation is looked upon as a symptom of a commencing menopause, or disturbances in the menstruation resulting from ovarian trouble, because palpation of a slightly enlarged uterus in connection with a large abdominal tumor may be very difficult or even impossible, especially if the tumor is intimately adherent to neighboring organs, thus interfering with the mobility of the uterus. Under these circumstances, the tumor is diagnosed, but not the pregnancy and a large number of such cases have been recorded where abdominal section was done for the ovarian tumor and the pregnant uterus only discovered at the time of operation. It is quite evident that the number of such mistakes must be large.

It has also happened that a pregnant uterus has been mistaken for an ovarian cyst and has been incised, when the true condition of affairs was discovered. When small cysts exist, which are closely adherent to the uterus, they may be easily diagnosed as extrauterine pregnancy. The soft, elastic ovarian cyst gives to the feel the impression of an impregnated tube, while the enlargement of the uterus which is always found in extrauterine gestation is naturally accounted for. The possibility of such an error is particularly probable when an ovarian tumor of long standing causes, by the suppression of the menses, symptoms of the beginning of pregnancy. Under some circumstances it is possible in these doubtful cases to come to a correct diagnosis only after repeated examinations have been made at intervals of two to three weeks, provided that serious symptoms do not compel the surgeon to interfere at once before the diagnosis is definitely determined.

The necessary gentleness in palpation, when one suspects a tubal pregnancy, is another cause of difficulty in making a diagnosis. The introduction of a uterine sound which has been recommended, but which, in my opinion is absolutely dangerous and should be proscribed, can at the most be only justified when intrauterine pregnancy has been excluded with certainty, a thing not easily done.

If an ovarian cyst is diagnosed during pregnancy treatment is based upon the decision as to whether the growth should be removed during pregnancy or after labor. Artificial interruption of pregnancy, which formerly was frequently advised, is at pres-

ent rejected since it is well known that the prognosis of an operation during pregnancy is hardly more unfavorable than when this condition does not exist. The question is whether, according to the present status of operative interferences, abortion, that is, interruption of pregnancy during that period in which we can with some certainty expect to deliver a living child, is still to be seriously considered. Very recently this has been advised by Barner. Others advise resorting to this measure only in those rare cases of hard neoplasms and dermoid cysts which lie immovable in the small pelvis and would thus seriously interfere with labor. In such cases where the possibility of the passage of a full-developed child is considered impossible or at least very difficult, induction of labor toward the end of pregnancy is considered proper by some because of the greater probability that a living child will be born.

Löhlein, without contradicting the theoretic qualification of this question in general, considers the indication for premature labor only in a certain class of cases with complications of pregnancy, namely, when, aside from the ovarian cyst, severe symptoms due to other pathologic processes develop and which are entirely due to gestation, such as the nephritis of pregnancy complicated with an ovarian cyst. Such a complication of pregnancy would be an indication for artificial emptying of the uterus even without the presence of a cyst. Consequently, from what has been said, it may be assumed that artificial premature labor has been abandoned in these cases. The reasons for this are apparent. In the first place, the prognosis of the fetus is always an uncertain matter, while, on the other hand, the mother is not relieved of her original trouble, the tumor, by merely emptying the uterus. The danger from the tumor, which is to be especially looked for in the postpartum, still remains, and sooner or later ovariotomy will be absolutely necessary.

Puncture of the cyst, which was so greatly advocated years ago, is to-day merely a matter of history, although a few writers have recently advised it for the relief of symptoms. It has probably been given up at the present time by the majority of operators, and rightly so, because in the first place, it does not cure the affection, as the cysts very rapidly refill, and also on account of the dangers, which are sometimes greater than abdominal incision. Infection of the cyst, which was formerly greatly feared, can, of course, be avoided by careful asepsis; but, on the other hand, injury to neighboring abdominal viscera, especially

the gut, can often not be avoided, and therefore abdominal incision is to be greatly preferred even for diagnostic purposes. It should always be recalled that after a large cyst has been evacuated by trocart, hemorrhage, both intraabdominal as well as intracystic may arise, partly as the result of a direct injury to the larger vessels, partly as a result of a sudden diminution of the intraabdominal pressure. Torsion of the pedicle, due to the greater mobility of the growth after puncture, has also been observed, while escape of the cystic fluid into the abdominal cavity carrying along with it particles of the growth, when it has been a proliferating ovarian cyst, has resulted in the formation of metastases on the peritoneum. When in conclusion, one reflects that acute peritonitis may easily follow puncture of a suppurating cyst, there is reason enough to reject this procedure.

To my way of thinking, the only rational procedure is ovariotomy, and the favorable results which have been reported when this operation has been undertaken during pregnancy have conclusively demonstrated that gestation is no contraindication to the operation. I believe that this statement is generally admitted by all surgeons of any experience. Out of 266 cases the mortality was only 5.4 per cent. for the mother. As to the interruption of pregnancy due to the operation I find a percentage of 22.4 per cent. It is evident that a great number of cases, particularly the unfavorable ones, have never been reported, and for this reason I merely submit the above figures for what they are worth without attributing to them any absolute value, but they certainly show that, as abdominal operations go, the prognosis should be considered very favorable, particularly for the mother and not so bad for the fetus.

If these figures are to be taken into serious consideration, it is necessary to weigh the question carefully whether in all cases where an ovarian tumor is found one should operate at once. The opinion that every ovarian growth found during pregnancy is an indication for immediate operation is, perhaps, most universally agreed to by operators. Since it has been pretty conclusively proven that the cases operated upon during the first few months of pregnancy usually go to term, it seems evident that an early operation should be undertaken, as the prognosis for the child is far better. If one recalls the causes which bring about uterine contraction after ovariotomy, it is not surprising to see that better results are obtained when the opera-

tion is undertaken in the early months of pregnancy. These are the mechanical irritation caused by the manipulation of the uterus and its adnexa, and the sudden cooling of the peritoneal cavity, which relaxes the muscular structure of the uterus, resulting in expulsion of the fetus.

The preparation of the patient for the operation during the second half of pregnancy may, in itself, stimulate the uterus sufficiently to cause a miscarriage. Then, again, during the operation, the uterus toward the end of pregnancy would bulge into the abdominal incision and has to be manipulated far more in order to get it out of the way so as to reach the growth. It may be, too, that the sudden cooling of the peritoneal cavity may have a different effect upon a much enlarged uterus, especially when the organ has been manipulated considerably in order to reach the tumor. The irritation produced from the lowering of the temperature should not be underrated, as it is well known that the application of cold to the abdomen is often resorted to in cases of postpartum hemorrhage in order to cause the uterus to contract.

It is quite evident that the favorable results obtained during the first few months of pregnancy are not merely accidental, and, what is more, under certain conditions, a timely ovariotomy may even prevent a threatened miscarriage, several instances of which have been reported.

Advising an operation as soon as possible in cases of ovarian tumor during pregnancy, in order to avoid the complications which may occur during labor, pregnancy or postpartum seems to me justified. It is unnecessary to discuss the need of operation in those instances where the growth gives rise to very troublesome symptoms, as well as for those tumors lying in the small pelvis which may seriously interfere with the progress of labor. In those cases, however, where the growth has not caused any symptoms, and where, in all probability, they need not be feared, it might be of interest to the child to temporize, provided that there are no evidences of the growth being malignant. Fehling prefers to temporize in cases of first pregnancy or where the women have had few children with the hope of obtaining a viable infant.

However, the difficult point in these cases is to decide what shall be done when the patient is first seen during the middle of pregnancy, because it seems a pretty well-settled matter that when operation is done at this time miscarriage is more frequent.

Therefore, under these circumstances, if no serious symptoms are manifest, operation may be deferred as long as possible.

At the end of pregnancy ovariotomy is the least serious, because the prognosis for the child is good, and even if it is undertaken during the ninth month and labor follows immediately upon the operation, it is probable that a living child may be born, provided that other conditions are favorable. As far as the mother is concerned, it is evident that by the removal of the tumor the complications resulting from it are removed.

It would appear that there are no special difficulties to be expected during labor, because many instances have shown that even during the period of expulsion the abdominal wound is not disturbed. However, if labor occurs before the patient has fully recovered from the effects of the anesthetic, one should be prepared for a rather profuse hemorrhage during expulsion of the placenta. For this reason it is perhaps preferable to remove the placenta manually as soon as the child has been extracted.

Bilateral ovariotomy has also been done during pregnancy, and it would appear that this interference is practically no more serious than when disease exists on one side only. Under these circumstances, however, an early operation is more imperatively called for, because when bilateral growths exist they not infrequently are of a malignant nature. Premature labor does not occur, apparently, with any greater frequency in these cases because the operation does not usually present any more difficulty than when one ovary is alone the seat of the trouble. It has been stated that, after bilateral ovariotomy, more serious hemorrhage occurs during labor and the postpartum on account of the effect of castration on the uterine mucosa, but I merely mention this fact and make no comment on it, having had no personal experience in the matter. I would, however, say that the relationship, as yet insufficiently understood, between the ovaries and the nonpregnant uterus in its normal condition, can also be applied to the pregnant uterus, and since it is generally admitted that during gestation ovarian activity ceases it may quite properly be assumed that when, after ovariotomy interruption of pregnancy occurs, this is due to the direct irritant action of the operation on the uterus.

DISCUSSION.

Dr. Henry Schwarz, St. Louis.—I do not want to see such a paper as this pass without some discussion. I think we are agreed with regard to the safety of removal of ovarian tumors

during pregnancy, and I think, too, we agree with most of the points brought out by the essayist. I might add, however, one more reason why we are inclined to operate, and that is this: ovarian tumors, if allowed to remain during pregnancy, often give trouble in the puerperium. The experience is quite common that the pedicle is apt to become twisted, and then operation has to be done immediately, and all of us have been called upon at times to operate within a few days after delivery, on account of a twisted pedicle, and to avoid that added danger it is another indorsement for operation during pregnancy.

Dr. Edward J. Ill, Newark.—I rise to indorse what Dr. Cumston has said in regard to the importance of removing every ovarian tumor that is found complicating pregnancy. Here we have a true complication in contradistinction to what has been said with reference to fibroids. Fibroids often accompany pregnancy, but rarely constitute a complication.

Dr. E. Gustav Zinke, Cincinnati.—I have had three cases, within the last six years, of pregnancies advanced to the end of the sixth month complicated with ovarian tumor of almost the same size as the uterus. They all suffered a great deal, and because of this readily consented to an operation. In each instance the patient not only recovered, but went on to the end of term with the child. In every case the pedicle was found twisted. In two I used the catgut ligature, and the patients suffered a great deal of pain on account of it; at least I attributed it to that, and it appeared as though they would miscarry. The pain gradually disappeared within a week, and both went on their way successfully to the end of term.

The third case happened at the time when Downe's electrothermic angiotribe was being used extensively in this country and, as the pedicle was very broad and thick, I used this instrument and no ligature. It was the last time I used the electrothermic angiotribe, not because of a bad result, but it is impossible to tell you what I endured for the first week by being constantly apprehensive of having a hemorrhage; but there was none. This patient had absolutely no pain after the operation, nor the slightest uterine contraction which at any time threatened to bring on premature labor.

Dr. C. C. Frederick, Buffalo.—I simply rise to report briefly the cases I have observed. If I remember correctly, I have seen four, operating upon all of them, three of which went on to term. I recall one case very vividly from the fact that when the woman came under my observation the edema of the lower extremities was very marked; there was dyspnea, with inability to lie down at night, and she was in a bad condition generally, having, withal, some albuminuria. I took out a large ovarian cyst, and two days afterward she aborted with twins. This is the only one of four cases of ovarian cyst complicating pregnancy I have seen fail to go to term. The tumor was as large as a good-sized pumpkin.

Dr. Thomas B. Noble, Indianapolis.—Relative to the removal of an ovarian tumor complicating pregnancy, our fear is a sequential abortion. That abortion, I believe, is due to three things: one is the nervous disturbance that attends the administration of the anesthetic, the next is the psychic influence, and the third is the amount of real trauma done to the pedicle. The first may be entirely eliminated, and the second may be very much modified by the character of the technic applied to the stump.

In your two cases, Mr. President, you will recall that in the case in which the ligature was applied the woman had considerable pain. I believe that pain was due, and is due in the vast majority of these cases, not to the constriction of the vessel, or of the nerve so much as it is due to traction upon the tissues *en masse*. I have many times observed that the ligation of tissue *en masse* has been followed in other operations by much suffering, whereas the simple ligation of a vessel alone is followed by little or no suffering. In this connection I will report a case of ovariotomy in which I was able to fortify this judgment.

A woman presented herself with a very large adherent ovarian cystoma, her general condition being such as to preclude the administration of a general anesthetic. Under Schleich's infiltration anesthesia the abdomen was freely opened without pain, and the tumor dissected from the abdominal viscera to which it was intimately adherent throughout its entirety, particularly in the biliary region, and in the pelvis low down upon the left side. This woman conversed with me during the operation, and I was able to experiment relative to the pain elicited and how elicited. She complained of pain after this tumor had been evacuated, dissected, and brought out upon the abdomen, when traction was made upon the pedicle as a whole; but by dissecting the ovarian artery and ligating it, then cutting off the mass, I produced no pain.

I have observed this in a number of cases in which celiotomy has been done under local anesthesia, and have noticed, too, that it is the general traction upon the multiplicity of nerves that produces pain, and not the ligation of single vessels, so that as a suggestion it might be well in this class of cases to use local anesthesia, puncture the cyst through a small opening, remove it, ligate, and drop back, with but very little pain, no shock, and possibly with a better prognosis for the continuation of the pregnancy than would occur did we do the ordinary operation under a general anesthetic. Under such an anesthesia as this we are necessarily more careful, we handle the tissues less, we will not produce such an insult to the peritoneal cavity, as we would be apt do under a general anesthetic. I have had no experience, but would be willing at any time from what experience I have had in other conditions to use local anesthesia in this condition.

SUBDIAPHRAGMATIC ABSCESS.

WITH REPORT OF CASES.

BY

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(Five Illustrations.)

A SUBDIAPHRAGMATIC abscess is a collection of pus, or pus and gas, which lies in contact with some portion of the under-surface of the diaphragm. It is rarely the result of a traumatism, but is generally due to some previously diseased condition. Subphrenic abscesses occur oftener than we have been led to believe. A careful study of the symptoms and signs of the condition may enable us to save, by surgical interference which is the only rational treatment, a large proportion of the cases. This subject is one in which this Association may do pioneer work, by the weight of its discussion, calling to the attention of the profession at large, the prevalence of these abscesses, the method of diagnosticating them and the proper method of surgical attack.

Other terms used synonymously with subphrenic are hypophrenic, suppurative pyopneumothorax subphrenicus, suppurative perihepatitis, perigastric and suprahepatic abscess. The abscess may be situated on the right or left side and lies either in the greater or lesser peritoneal cavity. The falciform ligament of the liver localizes the abscess, either in the right or left subphrenic region. Subphrenic abscess is usually the result of, or a complication of some pathological condition found in the abdominal viscera, but it may be due to a severe contusion of the chest. The most frequent cause is ulcer, with perforation of the stomach or duodenum. We find extra- and intraperitoneal causes of the abscess. A perinephritic or retrocecal abscess may spread upward or an empyema may perforate the diaphragm and produce a subphrenic abscess. One should bear in mind that a prolonged case of empyema may have a subphrenic origin; as the two conditions are frequently associated. It has been shown

that the lymphatics connect the right subphrenic space with the right pleural cavity.

A diseased appendix is often the forerunner of pus beneath the diaphragm. We may have a direct extension along the inner, outer or anterior portion of the ascending colon. The infectious agents may be carried along by the peristaltic action of the colon, through the blood current or the lymph channels. We may have subphrenic abscess due to a diseased appendix, without suppuration in or about the appendix. General peritonitis, due to any cause, may result in the formation of a subphrenic abscess; also suppurating hydatids of the liver or spleen and perforation of the gall-bladder and bile ducts; or rupture of an abscess of the liver. Many cases thought to be abscess of the liver may be perihepatic and a true subdiaphragmatic abscess.

Pus from caries of the ribs may burrow into the subdiaphragmatic space. A subphrenic abscess may perforate the diaphragm and infect the pleural cavity or the pus may enter a bronchus, where the lung has become adherent to the upper portion of the diaphragm. The presence of gas, as well as pus, in the abscess cavity may be due to a communication with some of the hollow viscera or to the presence of the bacillus aerogenes capsulatus. The pus has a very fetid odor. We may say, generally speaking, that we have a history of some previous abdominal disturbance. The symptoms of the disease which causes the abscess, will be the most prominent ones at the onset. The abscess may develop suddenly or slowly and is frequently mistaken for a pleuritic effusion. When we have symptoms in the lower part of the chest following acute or chronic abdominal disease, we should suspect the presence of a subphrenic abscess. The general condition of the patient is septic. We have pain in the epigastric, hypochondriac and lumbar regions, but the pain may not be only at the site of the trouble as it often extends to the surrounding parts. It may be sharp and pleuritic in character, over the lower part of the right or left chest.

A perihepatitis is usually present, in abscess of the right side and friction râles may be heard over the hepatic region. This is an early sign of extension upward of an inflammatory process. The temperature is irregular, remittent and often high. We may have recurring chills and sweats and there is a leukocytosis present. Depression of the liver and paralysis of the diaphragm may occur early, in the intraperitoneal variety, with lack of

movement of the liver during respiration. There may be present slight or well-marked jaundice. We have dulness on percussion in the lower part of the chest, and the area of dulness has been known to extend as high as the second rib and as low as Poupart's ligament. Should gas be present in the abscess, a tympanitic note may be elicited above the liver dulness, and should there also be present a pleuritic effusion, we will have dulness above the tympany. The upper line of dulness is not as well defined as in pleuritic effusion. It is highest in front and lowest behind. Changing the position of the patient does not affect the area of dulness. The movements of the chest are but slightly impaired on the affected side.

A very important sign is the fact that the breath sounds may be heard below the level of dulness, and if deep inspiration be taken, the line at which the breath sounds and vocal resonance are heard and at which vocal fremitus is felt is distinctly lowered. We have exaggerated vesicular breathing above the line of dulness. We may have amporic breathing below the vesicular murmur, due to the presence of gas.

Cough, expectoration and rapid respiration, with other symptoms of a chest affection are absent. The heart is not displaced, unless there is also present, a pleuritic effusion or a large abscess on the left side. A radiograph may show the bulging of the diaphragm upward and may be of value in obscure cases. We may have a pleuritic effusion also present, which renders a diagnosis still more difficult in a condition already obscure. Rigidity of the recti muscles in the epigastric region is sometimes found. The affected side is sensitive to the touch along the arch of the ribs and localized edema and bulging may be present. The prognosis with expectant treatment is grave. Early surgical intervention offers the only rational treatment. There were thirteen cases operated upon within three weeks after the onset of the condition, with a mortality of 15.3 per cent., while in eight cases, where operation was delayed longer than three weeks the mortality was 50 per cent.

An opening in the abdomen, in the epigastric region, either through the right or left rectus muscle, will permit us to form a correct conception of the abnormal condition present and the altered position of the viscera. This information will help one to determine the most desirable method of opening and draining the abscess. The aspirator needle is frequently used to determine the presence or the location of the pus in subphrenic ab-

scesses, and I believe great harm thereby has been done. While I would use the needle to aspirate fluid from the pleural cavity, I am fully convinced that it is not wise to employ it below the diaphragm. A proper incision will do no harm and may be the means of accomplishing great good. Pus may be present and the aspiration give negative results. We may fail to reach the abscess or the pus may be so thick that it will not enter the needle. There is a case mentioned by Weir, where the aspirator needle passed through an abscess containing two quarts of pus, and into the liver beyond and nothing but blood was withdrawn. These negative results may delay a needful operation.

The needle may infect a pleural cavity by aspiration of a subphrenic abscess through the transpleural route during the withdrawal of the needle as it passes from the abscess through the diaphragm and across the pleural cavity. The liver may also become infected by the needle after it has passed through an abscess and entered the liver. The aspirator needle has been discarded as an aid in determining the presence of pus in the pelvis and about the appendix, and yet twenty years ago it was a common practice. While I know that many surgeons continue to use the hollow needle to determine the location of pus in suspected subphrenic and liver abscesses, I am certain that it is attended with grave danger to the patient. A few years ago I performed an autopsy twenty-four hours after an exploratory puncture of the liver had been made with an aspirating needle by an eminent surgeon and found the abdominal cavity filled with blood. The bleeding was from a wound in the liver made by the needle, thus causing the death of the patient.

A careful study of the history with all the symptoms and signs will enable us to make a correct diagnosis without introducing the aspirator needle below the diaphragm. These abscesses have been opened and drained in a variety of ways, namely: through the anterior abdominal wall, between the scapula and anterior axillary line, with resection of the ninth and tenth ribs, the diaphragm having been opened below the reflection of the pleura, the incision having been made along the side of the aspirator needle, which has been left in place; by resection of the seventh to the tenth ribs in the mammary line, the opening into the abscess having been made below the diaphragm; by resection of one or two or the lowest costal cartilages; by opening the pleural sac and stitching the costal to the diaphragmatic pleura, previous to opening the abscess by incising the diaphragm; by

incision below the twelfth rib; by a combination of the anterior abdominal and axillary thoracic incisions; by incision in the tenth or eleventh interspace, in the posterior axillary line; by incision beneath and following the line of the costal arch, the peritoneum is exposed but not opened, separating the peritoneum from the diaphragm, beyond the adhesions which surround the abscess and then opening the abscess.

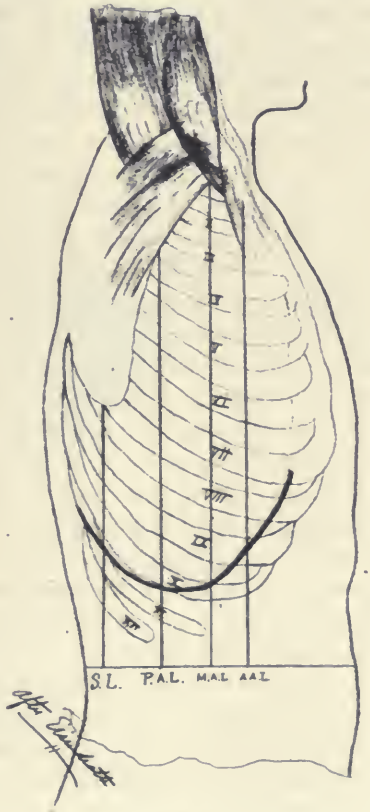

FIG. 1.

When there is no pus in the pleural cavity, drainage of a subphrenic abscess, by what is known as the transpleural route, has never appeared to me to be good surgery. These patients are already septic and show the effects of a severe illness, hence we should not add an acute affection of the pleural cavity to the existing condition. There is no necessity for resection of portions of the ribs in the primary operation, thus adding additional

shock to the patient already in a debilitated condition. Should a sinus following intercostal incision fail to close, which I believe will be but rarely seen, we may later resect the ribs at a time when the patient's health will be greatly improved. These abscesses should all be drained by incisions below the diaphragm, but should the case be complicated by the presence of pus in the pleural cavity, drainage of the same should be effected through another incision, made in the seventh or eighth interspace.

Some abscesses may be drained through this incision, while others should be opened in the postaxillary line, in the tenth or eleventh interspace. It will be found necessary to drain the large majority of these abscesses below the costophrenic sinus, in the axillary line, through an incision which permits us to see the structures we are dividing. The liver will frequently be found adherent to the parietal peritoneum, due to a perihepatitis. Some of these adhesions may be broken up with the fingers to enable us to enter the abscess cavity. There is sufficient room for the introduction of two large drainage-tubes between the ribs. I have for a number of years drained all my empyema cases through intercostal incisions, in both children and adults, with good results and see no valid reason for not employing the same procedure in cases of subphrenic abscess.

CASE I.—E. F. *Appendicitis not recognized; subphrenic abscess; perforation of diaphragm; empyema; abscess drained by median incision and incision in tenth interspace; death.*

Patient was a male, aged forty-six and a German by birth. He gave a history of having had la grippe, followed by pneumonia, twelve years ago and was sick about two months. Three weeks ago, he was taken with colicky pains in the abdomen. A physician was called who thought, at first, that the condition suggested acute appendicitis, but later typhoid fever. A few days later, the patient began to have pains in the right side of the chest, some dyspnea, slight cough and scanty expectoration. Another physician, called in consultation, diagnosticated the condition as pleuropneumonia. The patient continued in about the same condition until a week ago, when it was found that his pneumonia was not resolving and that a pleuritic exudate was taking place. Two days ago, he began to have distress in his stomach and an epigastric swelling was noticed. He has perspired freely at night but has had no chills. On his admission to the Rhode Island Hospital, March 15, 1903, the patient was pale and breathed and spoke with difficulty. Over the right lung, dul-

ness began in front at the level of the fourth inter space and extended into the right axilla and back. Posteriorly, there was bronchial breathing, excepting at the base of the lung, where there was an absence of respiratory and voice sounds. Over the upper part of the lung there were numerous fine, moist râles. There were a few moist râles over the lower part of the left lung, in the midaxillary line. The heart was normal.

There was no abdominal distention. In the upper part of the abdomen, on the right side, there was slight rigidity and tenderness on pressure. A mass continuous with the liver and extending one inch below the umbilicus could be felt. The mass disappeared at the left side beneath the free border of the ribs.

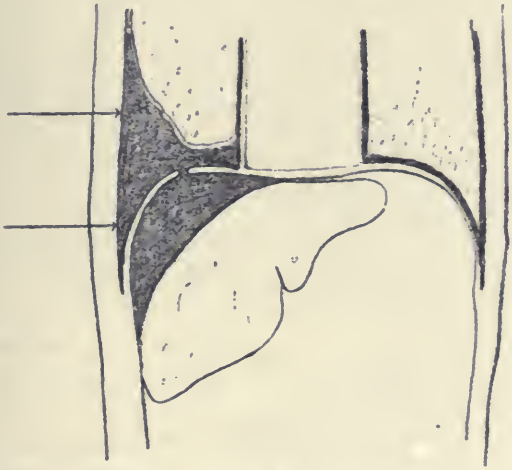

FIG. 2. CASE I AND CASE III.

In the epigastrium, there was a distinctly visible mass, which felt soft and which gave a tympanitic note on percussion. The patient's temperature was 100.4°, respiration 30 and pulse 130. His leukocyte count was 14,000. The urine was acid, 1022 sp. gr., contained very slight trace of albumin, a few hyaline casts, leukocytes, calcium oxalate crystals and epithelium.

The following day, March 16, under oxygen-chloroform anesthesia, a vertical incision was made over the right rectus muscle, extending from the costal border of the ribs to the umbilicus. On going through the muscular layer, an abscess was opened, which contained a large amount of foul, purulent fluid, necrotic slough and gas. The cavity was irrigated with

saline solution, washing out what appeared to be a fecal concretion. The cavity extended upward anterior to the peritoneum, into the right pleural cavity, through an opening in the front portion of the diaphragm. The lung above was adherent to the pleura. A probe was inserted eight inches through the opening in the diaphragm. On the left the abscess passed beneath the free border of the ribs.

Thoracotomy was done in the axillary line between the sixth and seventh ribs and some pus and sanguineous fluid evacuated. A rubber drainage-tube was inserted between the ribs into the pleural cavity and iodoform wicks inserted through the abdominal incision in radiating directions. The abdominal incision was partially closed by layer suture of chromic catgut. The patient's condition at the end of the operation was fair. On the day following the operation the patient's dyspnea increased, until by the evening he was in great distress. His strength failed and he died on the same night. Autopsy report follows.

Autopsy twelve hours postmortem, March 18, by Dr. Fulton.

Anatomical diagnosis:

Acute ulcerative appendicitis with perforation.

Retroperitoneal abscess extending into right pleural cavity.

Operation wound in abdominal wall and in right thorax.

Acute bronchopneumonia.

Edema of lungs.

Acute fibrinous pleurisy (right side).

Slight arteriosclerosis.

Fatty degeneration of the kidneys.

Fatty infiltration of the liver.

Body of a well developed and well nourished man. Body length 159 cm. No edema. Rigor mortis moderate. Slight lividity in dependent parts of the body. Pupils equal and moderately dilated. Operation wound, in abdominal wall, 13 cm. in length, 4½ cm. to the right of the median line, the lower end about on the level of the umbilicus. This is packed with iodoform gauze. Second operation wound about 8 cm. in length following the seventh intercostal space, situated almost directly below the axilla. This contains two pieces of rubber tubing, which extend into the pleural cavity. The greater part of the peritoneal cavity is perfectly smooth and normal. There are no adhesions and no inflammation of the coils of the small intestines. There is a large abscess cavity into which the abdominal incision leads, extending from within about 2 cm. of the level of

the umbilicus upward underneath the border of the ribs. This extends about to the median line and well over into the right hypochondrium. This cavity is directly over the liver and is separated from it by the diaphragm and the parietal peritoneum. This abscess cavity is entirely shut off from the peritoneal cavity.

The appendix lies behind and to the outer side of the cecum and extends upward for the first 5 cm. of its length. It is practically normal except that it is covered in by adhesions of the overlying cecum. The distal 3½ cm. of the appendix is about half ulcerated away, so that the lumen for that distance is entirely open. Right at the tip of the appendix is a large abscess cavity, in the lumbar region just below the border of the ribs and above the crest of the ilium. It involves practically all the retroperitoneal tissue in this region. The tissues here are greenish-gray in color, much infiltrated and almost entirely necrotic. This abscess cavity is filled with a grayish-black, granular, fibrinopurulent fluid, in which there are numerous, large, shaggy flakes of fibrin. Leading from this cavity upward through the retroperitoneal tissue is a sinus which varies from 3 to 6 cm. in width. This sinus burrows back of the posterior attachment of the diaphragm upward and forward opening into the pleural cavity in the region of the operation wound in the seventh interspace. By separating the adhesions in this region, the finger can be easily passed from this sinus downward and forward over the diaphragm in region of the liver where the burrowing material has separated the diaphragm from its anterior attachment to the right and also the peritoneum from the anterior abdominal wall. This is the region of the location of the abscess, into which the first-mentioned operation wound opens. There is considerable greenish discoloration of the tissues all about this burrowing, infiltrating abscess cavity and sinus.

The right lung is very much collapsed and the lower surface of the lower lobe is covered by a thick fibrinous exudate. This also extends up over a considerable part of the lateral and posterior surface of the lower lobe. There are numerous thick adhesions in the lower part of the pleural cavity, but these are rather easily separated. There are no adhesions in the peritoneal cavity, except adhesions in the tissue neighboring this abscess cavity. The small intestine, the transverse and descending colons are all easily removed. The ascending colon is everywhere adherent to the burrowing sinus and abscess back

of it. There are some comparatively light adhesions about the gall-bladder, and the undersurface of the liver. Pericardium is normal. Heart weighs 300 gms. The muscle is brownish-red, but rather soft and flabby. Valves are normal.

Left lung is very voluminous, being approximately twice the size of the right. There is, however, very little difference in weight, the left weighing 630 while the right weighs 550 gms. The left is tolerably soft and crepitant throughout and on section presents a grayish-red, slightly irregular, nodulated surface, from which there exudes a large amount of slightly blood-tinged serum. The right lung is very much collapsed. On section it is very dark red and is much less crepitant than normal. There are no areas of solidification, nor is there any evidence of any involvement of the lung tissue itself in the abscess. Aside from the points mentioned, the intestines are normal. Spleen weighs 160 gms. It is smooth and regular in shape. Cut surface is rather pale red and the markings indistinct. Consistence is not remarkable.

Stomach contains two ulcerated areas, both of them situated within 5 cm. of the pyloric valve. One of them is much elongated, measuring 5 x 1 cm. It has well-defined, abrupt, precipitous edges and a fairly smooth base. The edges are not particularly elevated or thickened. It is from 1 to 2 mm. in depth. The other area is about $2\frac{1}{2}$ x 8 cm., is well-defined in outline, edges not thickened or elevated. Its base is slightly pigmented and depressed about 1 mm.

Pancreas is normal. Liver weighs 1740 gms. It is extremely pale yellow. It is, however, smooth and regular in shape. On section the markings are very indistinct and the cut surface is very pale yellow. The portal vessels are perfectly smooth and show no evidence of involvement. Gall-bladder and bile passages are normal. Kidney weighs 300 gms. There is some injection of the cortex of the right kidney near its lower extremity where it comes in contact with the abscess cavity, but there is no real extension of the abscess itself into the kidney substance. Aside from this point, the two organs are not essentially different. The striation of the pyramids are fairly well marked, but the markings of the cortex are indistinct, the cortex being unusually pale. Capsule strips easily from a smooth pale surface. Adrenals are not remarkable. Bladder and genitalia are normal. Aorta shows numerous, small, irregular, bright yellow areas of thickening of the intima.

CASE II.—T. S. *Gangrenous appendix with abscess, appendectomy; drainage; subphrenic abscess, perforated diaphragm and bronchus; empyema; drained in ninth interspace; recovery.*

The patient was a young man, aged seventeen years, a student and single. Four days ago, he was taken with severe pains in the right iliac region. Had some tenderness over the painful area. The following morning he was nauseated and vomited. The pain and tenderness in the iliac region persisted and, with the vomiting, has continued every day up to the present.

An examination showed the heart and lungs to be normal. The abdomen was distended and the muscles were rigid over both

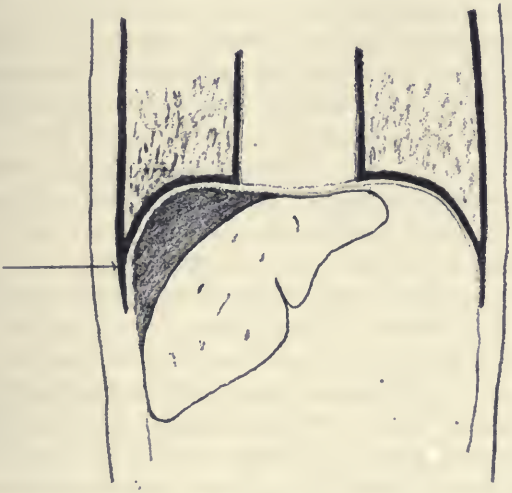

FIG. 3. CASE II.

sides. There was considerable tenderness on pressure over McBurney's point. The percussion note was dull in this region, being more dull posteriorly than anteriorly. No mass could be felt. The left side was tympanitic on percussion. A diagnosis of appendicitis was made.

Operation. Ether. On opening the peritoneum, free serum escaped. The appendix was freed and removed with the angiotribe and the stump ligated and inverted, with a purse-string suture. The fossa was drained with two cigarette drains and the wound closed in layers around them. At the end of the operation the patient's condition was good. The wound was dressed in forty-eight hours. Two days later the temperature still re-

mained up. Some fecal discharge from the wound was noticed. Over the right chest posteriorly, below the scapula, dulness was noticed.

On January 30, five days later, the patient coughed and brought up about a pint of pus, presumably from the lungs. The following day, the patient's temperature was 104°, and he was still coughing up pus. On February 5 the right chest was aspirated and pus obtained. Thoracotomy was done, a considerable amount of pus being evacuated and a rubber drainage-tube was inserted.

On February 7 the fecal fistula had closed, but there was still profuse drainage from the thoracotomy wound. On February 21 fecal matter was found coming from the wound in the chest. His sputum was examined for tubercle bacilli, but none was found. The patient began to improve gradually, and by March 24 he was out of doors and his temperature was normal. The tube was left out of the chest wound on the 31st of March. The patient left the hospital, April 14, cured.

CASE III.—R. L. K. *Gangrenous appendix; appendectomy; drainage; subdiaphragmatic abscess; empyema; drainage eighth interspace; ruptured into bronchus; death.*

The patient was a male, nineteen years old, white, single and a clerk by occupation. His family history and past history are negative. His present trouble began November 22, 1906, immediately following lunch, with severe cramps in the whole lower part of the abdomen. The bowels moved freely a number of times during the afternoon. Patient also vomited several times. The condition was diagnosticated by his physician as acute intestinal indigestion. He continued much the same until the morning of the patient's admission to the hospital, November 27, 1906. On that morning the abdominal pain became much worse and the vomiting has been frequent for the past twenty-four hours.

Physical Examination.—The abdomen was considerably distended, the recti muscles were rigid and there was general tenderness, more marked over the appendix region. There was free fluid in the flanks. The temperature was 103°, pulse 116 and respiration 28. The leukocyte count was 17,400.

At operation an incision was made over the appendix and free fluid escaped, a culture of which subsequently showed colon bacilli and streptoccocci to be present. The appendix was swollen, friable, gangrenous and covered with exudate. The appendix was removed, the stump ligated and inverted by a

circular suture of fine Pagenstecher thread and two cigarette drains inserted.

The patient did well for four or five days following the operation, although his temperature remained around 100°. The wound drained freely, the drains were removed in thirty-six hours and new ones inserted. About ten days after the operation the patient's temperature became septic in character, running from normal to 102°, he began to have great thirst and restlessness at night. The bowels became loose, the stools were green and watery, and micturition became frequent. The pulse was poor in quality, and at times the patient was delirious. He developed a slight cough with labored and frequent respiration. On December 13 there was dulness over the right chest extending up nearly to the nipple. The breath sounds were decreased and there were a few moist râles on inspiration. The leukocyte count was 9200. Two days later the dulness in the chest had extended up to the nipple, the breath sounds and voice sounds were very much decreased. The leukocyte count was 11,400. The chest was explored with an aspirating needle and pus found. A thoracotomy was done in the eighth interspace and considerable pus evacuated. Rubber-tube drains were inserted. The chest wound discharged very profusely, but the pulse continued to grow worse and the breathing continued labored. The patient was very weak and delirious. He gradually failed and died December 25, 1906.

Pathological Report. R. L. K.:

Macroscopical Appearance.—Specimen consisted of a mutilated appendix and fecal concretion about 1 cm. in diameter. The appendix was in two parts, the wall was thin, the outer surface ragged and the mucosa not especially remarkable. Over part of its extent the wall is partially destroyed and the outer surface is covered with a greenish exudate. The mucosa and greater part of the wall in this part is necrotic and greenish in color.

Microscopical Appearance.—The mucosa of the wall of the appendix is entirely gone and its place occupied by leukocytes and necrotic tissue. The wall is infiltrated with leukocytes and there is a layer of exudate consisting of leukocytes and fibrin on the outer surface. Diagnosis: acute ulcerative appendicitis.

CASE IV.—F. G. *Subphrenic abscess; incision right rectus to locate abscess; second incision in eleventh interspace; abscess drained; recovery.*

This patient, an Italian, aged forty years, a laborer by occu

pation, was admitted to the medical service, Rhode Island Hospital, November 21, 1907, giving the following history: twenty-one years ago, he was sick, for one month, with cough and bloody expectoration, pain in the right side of the chest and fever. He has been in this country for the last six years.

During September, 1907, patient suffered with a diarrhea, which lasted the entire month. He had five or six small movements a day containing blood and being accompanied by tenesmus and colicky pain in the abdomen. In October he began to have pain in the right side of the abdomen below the free margin of the ribs, where it has remained ever since. The

FIG. 4. CASE IV.

pain has been constant, aching in character and radiating to the back, right shoulder and across the abdomen. It is made worse by coughing and deep breathing. There is no vomiting, eating does not aggravate the pain. There has never been any jaundice or urinary symptoms. He has had a slight cough, with a small amount of whitish sputum, frequent severe night-sweats and slight shortness of breath. He has lost considerable strength, but only five or six pounds in weight.

On examination, the patient had dulness and absence of breath sounds below the lower angle of the right scapula. The liver was enlarged and tender. The temperature ran from 99° to 100°. The leukocyte count was 8900. An *x*-ray plate showed

faint cloudiness at the base of the right lung. An exploratory puncture in the fifth space, anterior axillary line, was negative. At the patient's own request, he was discharged December 5, 1907, without a diagnosis being made.

On February 4, 1908, the patient reentered the hospital, on the medical service. He looked poorly nourished and considerably under weight. The chest was somewhat barrel-shaped. The right half below the nipple appeared distinctly larger than the left and measured from midsternal line to vertebral line an inch and a half more. The movements on the right side were more restricted and superficial, the veins more prominent. There was tenderness on pressure and percussion over the enlarged area. There was dulness extending downward into flatness on the right side, below a line extending through the right nipple and middle of right scapula. The vocal fremitus was not diminished, the breath sounds were absent and there were no râles. There was slight dulness at the left apex. The liver was very easily palpable about an inch and a half below the free margin of the ribs. The edge was smooth and tender on pressure. No masses could be felt. The patient's chest was explored with a needle in the eighth intercostal space with a negative result.

The patient was transferred to the surgical service and after examination, February 11, a diagnosis of subphrenic abscess was made and operation was decided upon. An incision was made through the upper part of the right rectus muscle. The liver was found enlarged and congested, with adhesions about it, to the parietal peritoneum. A fulness was felt above the liver, between it and the diaphragm, which showed us the location of the abscess. The edges of the abdominal incision were clamped together and a second incision made in the tenth intercostal space, midaxillary line. The subphrenic sinus was opened and a small amount of serum found in it. This opening was packed with gauze and an abscess, which was found below the diaphragm and over the liver, was opened and drained. The abscess contained fully a pint and a half of odorless pus. A large drainage-tube was inserted and the incision closed about it with silkworm gut. The abdominal incision was closed in layers. The patient at the end of the operation was in good condition.

Following the operation, the wound drained profusely, but the patient's temperature remained irregular. He complained

occasionally of pain, pleuritic in character, in the right side. Dulness over the right side still persisted.

On March 2 a troublesome diarrhea set in. Four days later an exploratory puncture was made in the seventh right intercostal space, posterior axillary line, but no fluid was obtained.

On the morning of March 7 he began to cough violently and expectorated a large amount of purulent material. His pain was relieved, his temperature dropped to normal and remained so all day. For one week the patient continued to raise large amounts of purulent sputum. The temperature steadily remained normal. The discharge from the subphrenic abscess gradually diminished in amount. The patient was discharged April 15, feeling perfectly well and requiring dressing only every other day. The chest still showed some dulness and diminished breath sounds at the base of the right lung, but there was no cough or expectoration. One month later the patient was perfectly well.

CASE V.—F. W. *Subdiaphragmatic abscess; probable perforating duodenal ulcer; incision eleventh intercostal space; recovery.*

The patient was a German, forty-nine years old, married and an assistant manager of a theater. His family history is negative. Four years ago he had an attack of acute inflammatory rheumatism in right ankle and knee, which incapacitated him for four weeks. Two years ago he was thought to have had typhoid fever and made a good recovery. On the twenty-ninth of last April he was again taken sick with acute rheumatism, involving the left ankle. He was ill about one week this time.

On May 31 he had a third attack of rheumatism, confined to the right ankle at first, then passing to right knee and shoulder successively. He recovered from this attack and was out in about one week. Four days later, on June 10, he was taken with considerable pain in the lumbar region over the right kidney. There was moderate tenderness over the kidney on pressure, but because of the man's size the kidney could not be palpated. The pain was aggravated by any muscular exertion. Nothing abnormal in the chest could be found at this time. The pain and tenderness persisted and on the second day after the onset the patient was obliged to go to bed. He began also to run a temperature of 99° to 105°. Repeated examination of the urine showed only a few red blood-cells, leukocytes and epithelial cells. After a day or two in bed, the acute arthritis reappeared in the right ankle and knee. The pain and tenderness in the right lumbar region gradually subsided with rest, but in four or five days it

reappeared this time also being in about the eighth and ninth costal interspace along the posterior axillary line. On auscultation, a few dry râles could be heard in this region. Later the râles became moist, and gradually dulness appeared over the right chest, extending up to a line drawn through the nipple and inferior angle of the right scapula. Over this area vocal fremitus and the voice and breath sounds were diminished. Above the line there was hyperresonance, with exaggerated voice and breath sounds.

On June 16 the leukocyte count was 17,500. On this day the right chest was explored with an aspirating needle, but no

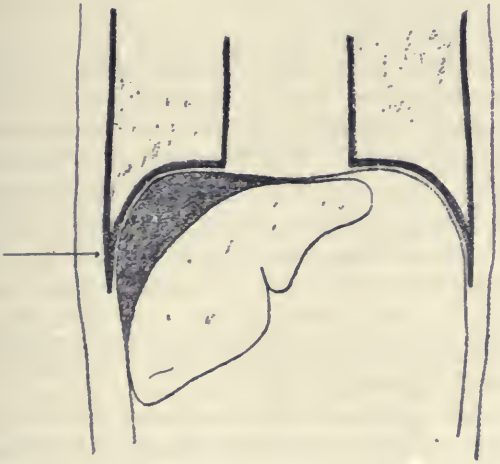

FIG 5 CASE V.

fluid was obtained. A diagnosis of subdiaphragmatic abscess was made and the patient sent to the hospital.

On June 20 an incision was made in the eleventh interspace posterior axillary line. The upper pole of the kidney and peripheral tissues were normal. Dissecting up behind the peritoneum, with the finger posterior to the liver, the peritoneum was punctured and a pint of thin, foul pus was evacuated. A large rubber drainage-tube was inserted and the skin incision partially closed with silkworm-gut sutures. The abscess drained profusely for several weeks. There was absorption enough to give the patient a septic temperature. As the abscess contracted the discharge lessened, the temperature dropped and the patient gradually recovered.

CASE VI.—C. A. O. *Subdiaphragmatic abscess; incision eleventh interspace below costophrenic sinus on right side through attachment of diaphragm into abscess; death.*

Patient was a male, twenty-three years of age, white, single and a teamster by occupation. One brother had died of pulmonary tuberculosis. Patient's previous health had been good. Two weeks ago he began to have chills followed by fever, which caused him to go to bed. He had cramp-like, intermittent pain in the region of the stomach, more severe possibly on the left side. He had some nausea, without vomiting, and some vertigo. The pain has constantly increased in severity since its onset. The patient feels lame, very weak and exhausted. On admission to the hospital, July 2, 1908, his temperature was 102°, pulse 90 and respiration 25.

Physical Examination.—Over the right side of the chest there was dulness, extending up to the right nipple. The breath sounds and voice sounds over this area were very faint. There were a few coarse râles. Vocal fremitus was decreased. Above the nipple line front and back there was hyperresonance with exaggerated breath and voice sounds. Vocal fremitus was increased also. There was fulness over part of the right chest. The abdomen was considerably distended. The recti muscles were rigid. The lower border of the liver extended about one inch below the free margin of the ribs and was tender on pressure The spleen was slightly enlarged.

On July 3 an incision, under cocaine anesthesia, was made in the posterior axillary line in the eleventh interspace by my colleague Dr. W. Keen. The incision was carried directly into the liver substance, as that organ was adherent to the lateral abdominal wall. The line of adhesions formed by perihepatitis were broken down over the dome of the liver toward the median line of the abdomen and a pint and a half of thick, foul pus was evacuated. Two large rubber drainage-tubes were inserted into the abscess cavity and the skin incision partially closed with silkworm-gut sutures. At the end of the operation the patient was in a state of considerable shock. Saline solution was given under the skin by hypodermoclysis and by continuous drip by rectum. Patient continued to fail, and died six hours after operation.

The main facts which I wish to emphasize are: The avoidance of the transpleural route; the dangers in the use of the aspirator needle and the unnecessary resection of the ribs; the

advocacy of exploratory abdominal incision, with drainage through the same or in the tenth or eleventh interspace in the postaxillary line.

DISCUSSION.

DR. CHARLES L. BONIFIELD, Cincinnati.—Mr. President: This is an exceedingly interesting paper on a subject of which we know as yet comparatively little. I recall two cases of subphrenic abscess that have come under my observation. One was a boy, ten years of age, who had an attack of appendicitis. I saw this case between fifteen and twenty years ago. The boy had a typical attack of appendicitis, and was not operated on. He ran along for two weeks, apparently convalescing nicely, when suddenly his temperature went up again, the symptoms became aggravated, he had some chills, and seemed to be in a very bad way. At this time I called one of the leading internists in Cincinnati in consultation, but he was unable to make a diagnosis of the condition. The only physical symptoms were an increased area of dulness over the liver. We were watching and waiting, when one night he coughed up about a pint of pus and made a very good recovery. There is no question but that the abscess came from under the diaphragm, ruptured into a bronchus, which enabled him to cough up the pus and thus brought about recovery. He has not been operated on for appendicitis to this day.

The other case I saw two or three years ago in Hillsboro, Ohio. The patient gave a history of infection of the gall-bladder and bile ducts, and the liver area was greatly increased. I opened the abdomen for exploratory purposes, and in making an investigation my finger slipped into an abscess cavity above the liver, and I drained out three pints of pus. The condition of the patient was bad. I simply put in a large drainage-tube, and he made a slow but complete recovery without any other treatment.

One point the essayist made is of great value, and that is, the aspirator is of no use below the diaphragm unless the abdomen has already been opened with a knife. A good many years ago I saw a case in consultation with a professional friend in Kentucky, in which we both made a diagnosis of abscess of the liver. At that time it was thought an abscess could be evacuated by aspiration before opening the liver with knife or cautery. The doctor, at my suggestion, introduced an aspirating needle two or three times, but did not get any pus. I then tried it four or five times, and finally gave it up, but was, nevertheless, quite sure that the man had an abscess of the liver. He died about three days later, and autopsy showed that I had passed the needle on every side of the abscess, but happened not to get the point of the needle into the abscess cavity. This case showed me the utter futility of using an aspirator as a means of diagno-

sis in abdominal conditions, and since that time I have never used an aspirator in this way.

Dr. Albert Goldspohn, Chicago.—While this paper is not strictly a gynecologic one, at the same time it is more fruitful than many of the old threadbare themes in gynecology. No doubt all of us have opened abscesses in the lumbar region which, on their interior upper wall, reached to the diaphragm. Some of us have done this repeatedly. I know that I did it in a number of instances in years gone by, but have forgotten the details of the cases. Most of these abscesses undoubtedly came from the appendix originally. An interesting case of that kind which I recall very accurately occurred about two years ago. A man, a farmer, had appendicitis, and was treated by his family physician medically. He had chosen medical treatment until he developed an abscess, a large swelling in his right loin that pointed, and the family physician took a bistoury, punctured it, and let out a considerable quantity of pus. But while that patient was temporarily improved, he never got well; a sinus kept discharging a little for many months, until finally the family physician shipped his patient to Chicago, and he got into my hands.

I followed up the sinus, and found it went into the region of the right kidney. When I had explored the entire tract to that extent, I found there quite a characteristic, well-formed ecal stone, lying in immediate proximity to the right kidney. A careful examination of this body was rather convincing to myself and to all others who had occasion to see it, so much so that it confirmed the origin of this sinus. So, after exploring this old cavity, cleaning it out, packing it thoroughly, and preparing for clean work, I made an incision over the region of the appendix and found, what we so often find, quite a healthy appendix—an appendix that really showed nothing of any such evil history—yet it must have been the source because the clinical history was complete, as confessed by the family physician, who had wrongfully chosen medical treatment and not operation. But it is singular how such appendices will recover from numerous attacks. Of course I did not leave the appendix, and made also a continuous channel from the healthy appendicial site into the other, draining the pocket completely, which led to complete recovery.

Recently another neglected case of a different form came to my hands. The patient was a boy, about ten years of age, who evidently had a tubercular pleurisy on the right side, with an exudate that became purulent, then infected the subdiaphragmatic space, and pointed in the right loin. In this case it was not the fault of the physician, but the people's ignorance that caused the boy to be neglected and from having proper surgery done. When the abscess looked as though it wanted to rupture, the physician introduced a bistoury, made little holes, and let the pus run out. But the patient did not improve, but became extremely reduced, and when anyone could see that he was going to die, the people were willing that he should have something

else done. I followed up these sinuses from these apertures as a guide, got up to within the eleventh and tenth ribs, that is, just below the attachment of the diaphragm to the eleventh rib, and found a cavity that reached above the liver inward a distance of three or four inches, as far as I could reach with the finger, after I had enlarged the incision by the resection of a rib. Then there were signs of empyema, consequently I opened into the thorax, without resection of the ribs, then connected the pleural abscess cavity with the subdiaphragmatic abscess cavity, and drained both. The boy improved, but naturally the condition was tubercular in character, and the outcome is uncertain.

I cannot agree with the essayist about avoiding the resection of the rib in draining empyema. If we force sufficient dra nage-tubes through the ordinary intercostal space, tubes that are worth anything, we will do something that hurts the patient in the dressings thereafter; the apertures in the drainage-tubes become clogged with granulations, the tubes must be turned, and in so doing it is a torture to the patient. I would prefer to resect a rib so as to be able to empty the abscess in a comfortable manner. The resection of a rib is a small matter, and it does not add materially to the shock. I like to have two openings, making one opening first at a point of safety, and from that take a guide to the lowest point I can find, draining efficiently from the bottom. I can readily see in regard to some of these subdiaphragmatic abscesses, where the abscess is located nearer the median line of the body, not laterally, that there a median incision, as the essayist has advised, is good surgery. But the majority of these abscesses are located not so near the mediastinum as they are to the lateral wall of the body, and I think a good many of them can be reached by a primary lateral incision.

Dr. I. S. Stone, Washington (by invitation).—The paper which has been presented to us is very interesting, and I enjoyed hearing it read. While I indorse very heartily the diagnosis and treatment, especially the operative treatment suggested by the writer, it occurs to me that there is some doubt about the propriety of calling it a distinct special abscess or disease. I think the most interesting points brought out by the speakers have been in regard to abscess which has followed appendicitis. It occurs to me that this is very much like an extension of an abnormal process; in other words, the extension of a suppurative process which is common elsewhere. There is a limitation of the suppurative process at the diaphragm simply because for the present it offers strenuous opposition to the farther advance of the mischief. Now, all of us have met with cases something like this; at the diaphragm pus will form, and after a long time perforation will occur, and we will get empyema; but often we get perforation into a bronchial tube. It has been my misfortune to see these cases, and I have no doubt others present have seen them. If the abscess stops temporarily at the dia-

phragm, especially if it begins there, it is a subphrenic abscess; but if the abscess begins at the appendix and extends and perforates into a bronchus, it is not a subphrenic abscess any more than it is an appendicial abscess. But we can say it is simply an appendicial abscess, its opening being into a bronchus.

So far as the location of these abscesses is concerned, I certainly think it is about time that we should either define our meaning better or get a little better phraseology. I read two good papers on this subject some time ago, and I think the essayist has copied the phraseology of former writings rather than exercised his own judgment in the matter of pathology and pathologic description. Pardon me if I take the liberty of saying that.

There are one or two interesting complications in regard to the localization of pus in this place. A number of observers have mentioned subphrenic abscess on the right lobe of the liver as you have to-day, Mr. President; but there is another subphrenic abscess located in the epigastrium, and precisely the same serious results follow. It is very puzzling to diagnosticate such cases, far more puzzling than in the cases which have been spoken of by the essayist and by Dr. Goldspohn. In the first place, there is no history of appendicitis to help one in making the diagnosis. In the next place, it has the characteristic features of other diseases. For instance, there may be acute pancreatitis. You have this to exclude. There may be something like this, which I have seen in the practice of a young surgeon—namely, perforating ulcer on the lesser curvature of the stomach, and from that swelling which might well be called a subphrenic abscess at that point; but it went on, perforated the diaphragm and into a bronchus just as an appendicial abscess may do. But in the meantime there was a diversity of opinion by excellent men as to what that swelling was.

In closing, I would say that subphrenic abscess should have its initial starting-point where it is found, not migrating from elsewhere, and then obtaining its name. There should be cause for the suppuration, such as a suppurating rib, with collections of pus in the peritoneum or pleura. There may be other causes from the liver; but by all means, let us define the condition a little more accurately.

I know there is a general antipathy to excising a rib or opening the pleura in any operation, and operators like Bonifield and myself, who operate so much in the abdomen, are more shy of the pleural cavity than of the peritoneal cavity, but I think with a little closer acquaintance and more experience in this regard we will find these patients can withstand our surgical onslaughts. I have opened the pleural cavity and, when necessary, have not hesitated to resect a rib. There is little or no danger from that operation; air will pass in and out, and in getting after an abscess of this character, there is no reason why we should not resect a rib, if there is necessity for draining through the pleura. The

cases I have seen have recovered because there were no other complications.

Dr. Herman E. Hayd, Buffalo.—I have been surprised to find how frequently this complication takes place in connection with suppurative diseases, particularly of the appendix, gall-bladder, and stomach. I looked over my records before I left home, and if I had read Dr. Keefe's paper some years ago it would have helped me probably in the management of those patients I have already had under treatment.

One was a boy, eleven years of age, upon whom I operated for an acute gangrenous appendicitis, with localized abscess. I opened the abscess cavity, drained, washed out with peroxide of hydrogen, broke up adhesions, and removed the appendix. The boy did nicely at first. About the eighth day, however, he complained of some pain in his side of which I was suspicious, and thought perhaps it was pleurisy. In the course of a couple of days he ran a temperature; his pulse increased; he became quite septic, and I made up my mind that we had an empyema to deal with. I took a large needle, pushed into his chest, and out flowed a lot of dirty, fetid pus. I then quickly removed a piece of rib about an inch in length and drained the empyema. The boy did very well for two or three days; then his temperature rose every night; he was suffering so much pain, that I looked him over carefully, and found there was a good deal of edema of the skin over the region of the liver. I made up my mind there was pus below the diaphragm. I put him on the table again, gave him chloroform, and opened a subphrenic abscess which contained foul-smelling pus such as was found in the pleural cavity and in the appendix abscess. In washing out the cavity below the diaphragm fluid came through the pleural cavity, showing that the diaphragm had been perforated and a communication existed between the abscess below the diaphragm and the abscess above the diaphragm. That suggested to my mind, as the essayist brought out in his paper, the frequent association of subphrenic abscess, with collections of pus in the pleura, and it started the thought as to whether the process is not really one of direct extension, from the lymphatics below the diaphragm up through the diaphragm into the pleural cavity.

Another case, equally interesting, was that of a young woman, twenty-six years of age, who was two months pregnant, and brought to the German Deaconess's Hospital by Dr. Gaertner. I operated on her for appendicitis, with localized abscess, removed the appendix and put in a drain. Five days afterward she miscarried. She got along pretty well after the appendix operation, and there was no complication after the miscarriage. On the ninth or tenth day vomiting occurred; Douglas's pouch considerably distended and very tender. I did not give chloroform; I made an incision in the culdesac and let out a lot of pus. In the next three or four weeks, not doing as well as she might, I did a section and removed a pyosalpinx on the right side.

Whether the pyosalpinx existed previous to the appendicitis, I do not know, but in all probability it did. She might have become pregnant through her left tube, and the right tubal abscess may have been a complication of appendicitis. The other tube was considerably involved, and I removed that with the left ovary. In about seven months or so Dr. Gaertner brought her to the German Hospital. A lump existed along the costal border, and she was running a temperature of 104°. I operated and opened a subphrenic abscess, which was situated anteriorly to the liver and contained half a pint of pus. She did remarkably well again; but in the course of six or seven days her temperature began to go up once more; she suffered a great deal of pain in the loin, when I again put her on the table, and with my finger in the abscess cavity in front it was evident I had to deal with a big collection of pus along and behind and to the outside of the ascending colon. I opened it and much pus escaped. There was no communication, however, between the front abscess and the retrocecal abscess. The kidney was perfectly healthy, presenting no evidence, from the urinary examination, of disease. This case was rather interesting, in that a subdiaphragmatic abscess had occurred about seven or eight months after operations done on the appendix and culdesac.

Another case was one of acute perforative ulcer of the stomach. I saw the patient in the morning. The perforation occurred during the night, and a neighboring physician took care of him. I took him at once to the hospital and opened the belly. The perforation was sewed up, drained, and the man did satisfactorily. Then this complication occurred, but somewhat later than Dr. Keefe reports as his experience. About the eleventh day he began to complain of pain in his side, when a friction sound was heard, and in a couple of days more a needle was inserted and pus was found. I opened the empyema, took out a piece of rib, and drained. Unfortunately, the man got a general pyemia. I opened his knee-joint and shoulder-joint. He had abscesses along his arms and legs. The other two cases recovered, but this man died.

What has been said with reference to the use of the trocar is very important in the discussion of this subject. Personally, I regard it as a very poor and unsatisfactory instrument. If we get thin fluid, as in the case of pleurisy or in tapping a synovial cyst or a thyroid cyst or any other similar condition where we get thin fluid, then it may answer the purpose, but if we obtain thick pus it is not satisfactory. I have in mind a case of empyema in a boy whom I saw in consultation and in whom I used a very large trocar. He had a dull chest. I introduced the needle and no fluid escaped. I inserted it in another place, but could not get any fluid. The next day the family decided that it was not a surgical case, so called in Dr. Rochester, who used a larger trocar and out came pus. The patient was taken to the General Hospital and operated on for general empyema. I

think we should accentuate the uncertainties in connection with the trocar as well as many of the dangers in using it.

Dr. Miles F. Porter, Fort Wayne.—In connection with this discussion it occurs to me that this point should be emphasized, namely, that subdiaphragmatic abscess or abscesses are secondary conditions. They mean primary trouble elsewhere in the vast majority of cases, either in the lungs above or in the belly below, and therefore they originate on the right side very much more frequently than they do upon the left; because on the right side directly under the liver within easy communication we have the gall-bladder and gall ducts, the ulcer-bearing area of the stomach, duodenum, and the appendix. But in perforations of the stomach, on the other hand, particularly the posterior wall, opening into the lesser cavity of the duodenum, not infrequently the abscess will manifest itself first upon the left rather than upon the right side.

Another point of practical importance, and one worth emphasizing, is the importance of fecal concretion as compared with the appendix itself in operations upon abscesses or conditions resulting from appendicitis. We have heard a good deal about the importance of removing the appendix. I want to say that I have seen a far greater proportion of appendicial abscesses kept up by fecal concretions outside of the appendix, with comparatively healthy appendices, than I have kept up by the appendix itself. I have met with the experience related by Dr. Goldspohn a number of times, where he found a fecal concretion, and in looking at the appendix found it healthy, and showing no sign of the trouble it had produced in former days.

Concerning the resection of the rib or ribs, that is a question to be decided by the man who does the operation. If a timely operation is done for empyema we do not need to resect a rib; all we want is an opening sufficiently large to drain the cavity thoroughly before we get a thick pleura. That is all that is necessary, for the average rib space will allow the introduction of the finger without any trouble. If you wait until you have an abscess cavity as thick as your finger, you must make provision for a larger opening for drainage, and in addition to that you must give the abscess walls a chance to collapse, hence you may have to resect not only one, but half a dozen ribs.

It seems unnecessary to say anything in regard to the use of the aspirator as a means of diagnosis below the diaphragm, but if you will pardon me, I would like to say one word about it, namely, to condemn it.

Dr. Ellis W. Hedges, Plainfield.—I want to take a moment or two to relate a case which is still under treatment with subdiaphragmatic abscess and which illustrates what Nature will do. The patient is a young woman, twenty years of age, whom I saw two months ago. She was brought to the hospital with a suppurating appendicitis that had ruptured. On opening the abdomen a pint of pus came out. The appendix presented and

was removed, drainage being established for two weeks. Then dysentery set in which nearly killed her. It ran for two weeks before we were able to get it under control. Within a few days she began to do very well, in that fever subsided, and we thought she was going to recover. Within four weeks from the time she was brought in she complained of severe pain in the right chest over the lower ribs in the axillary line. There was not only pain, but sensitiveness to touch. She had such exquisite agony that she could not turn in bed. A long breath gave her intense pain. She had no cough. Examination of the lungs failed to show anything abnormal. We waited for something to develop and failing to find it, we went into the pleural cavity with a large aspirator, thinking we would find possibly something there. But the introduction of the aspirator was negative. We then inserted it above the liver, but all of the punctures were fruitless.

In this connection I invite attention to the fact that Kelly, in his work on appendicitis, contrary to the learned gentlemen who have spoken to-day, distinctly advises using an aspirator whenever one suspects diaphragmatic abscess. The woman's pain and septic symptoms continued, and we could find no fulness on that side, no bulging anywhere between the ribs, no edema—nothing to tell us where to go in. We felt sure we had a subdiaphragmatic abscess. In desperation, and not being able to find anything by the aspirator, while we were getting her ready for the operating-table, we noticed a slight bulging on the back in the eighth or ninth interspace, about three inches from the spine of the vertebra. We made an incision there, and let out nearly a pint of fetid pus, after which she made a nice recovery and is now well. This is one of those cases in which Nature seems to have found a way out.

Dr. Francis Reder, Saint Louis.—The appendix has been much in evidence in connection with Dr. Keefe's paper. I had a patient with a subphrenic abscess on the left side, the origin of which was carcinoma of the splenic flexure of the colon. I simply wish to mention this as an instance of a subphrenic abscess on the left side.

I am somewhat surprised to hear one of the speakers say that chronic empyema does not require rib resection. It is true we do not always know in a case of empyema whether rib resection is indicated because we do not know if it has reached the chronic stage. It has been my experience that it is necessary to resect one and sometimes two ribs in order to get the proper drainage. The transpleural route for attacking a subphrenic abscess is safe when the surgeon feels satisfied that sufficient adhesions are present. These abscesses are very obscure; they are very puzzling; as Dr. Porter has remarked, they are the sequelæ of primary affections elsewhere. Their location is often extremely difficult to diagnosticate. Those abscesses that present diagnostic difficulties as to location and size should be attacked by the abdomi-

nal route. The danger of soiling the peritoneum can be minimized by suitable packing with gauze.

Dr. Hugo O. Pantzer, Indianapolis.—I wish to relate briefly my own case for the purpose of illustrating the obscurity of this disease with which the abdominal surgeon is sometimes confronted. The case went on without my own recognition of it until an abscess broke, and, being handicapped by the situation, I was unable to convince the attending physicians of the condition. I had remittent fever in 1881, and soon satisfied myself that it was malaria, and not typhoid. Although for twenty years I was made heavy with this disease, I never thought once of applying a remedy to my ordinary heaviness, headaches, and the like. I underwent treatment at the hands of rhinologists for frequent attacks of coryza, having two or three in a day for eight years without getting any relief. The case was evidently one of the estivo-autumnal type, the abscess rupturing on the upper surface of the liver. There were no characteristic symptoms of any kind making it necessary for me to discontinue work. But a man never knows when to give up.

I had a sanitarium at the time and had a heavy clinic at the hospital on Wednesdays, and one Wednesday I decided to remain home on account of a feeling of general heaviness, and to have a day or two of sleep. On the following Saturday night I was found unconscious with a flickering pulse, not perceptible at the wrist. I regained consciousness in the morning, and the attending physicians who were called at the time were unable to make a diagnosis other than that of indigestion. I remained in bed, sat up on Sunday in an easy rocking-chair, and then had a pain, which was followed by a terrific chill, and every subjective evidence of a perihepatitis circumscripta, confining itself to the upper surface of the liver. Interesting at this stage is that following a ride of six hours through the mountains last year, for two or three weeks subsequently I was conscious of the upper area of my liver, but otherwise I have had no trouble from it.

Dr. Keefe (closing the discussion).—I shall only occupy your time for a few moments. It is evident that I did not make myself very clear with regard to the definition. I laid great stress on the fact that this (abscess) is not a disease. Every abscess has had some diseased condition back of it, or it may produce a diseased condition, and it is necessary that we should call one a pelvic abscess, another appendicial abscess or a subdiaphragmatic abscess, and in order to do this we should try to find out where the abscess originates. But as a matter of fact we may operate and even then not know the origin of an abscess. In some of these cases I do not know whether the abscess is due to ulcer of the stomach or to perforation of the duodenum. Many cases of this type that have been operated upon and thought to be due to ulcer of the stomach may have been of the duodenum. We can have a subdiaphragmatic abscess due to a diseased ap

pendix, the sinus through which the infection passes upward being closed. This is a condition not frequently recognized.

As to the resection or nonresection of the ribs, it is my observation, and I have been glad to hear what has been said by others in reference to it, that one of the best evidences of the value of nonresection of the ribs is that in these cases I did drain between the ribs and the men are well. Some of you may say, one can take out a piece of rib in a few minutes; I have not seen it done in that time. The history of people with subdiaphragmatic abscess is that very strong, able-bodied men are prostrated by the septic condition and if you add a little more shock or trauma to their state, it may kill them. Therefore, the best way is to cut into these cases quickly and by so doing we may save their lives.

A HEMOLYTIC TEST FOR MALIGNANT TUMORS.

BY

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INTRODUCTION.

I HAVE heretofore reported for the American Society of Cancer Research our observations upon hemolysis in malignant tumors. This is a report of further progress. The technic has been greatly improved and now seems to be quite accurate. It is exacting, must be precisely done and every step amply surrounded by checks and controls.

Dr. D. A. Prendergast made the first series of observations, after which Miss Ora Lewis took all the responsibility of the technic for seven months, and made many improvements during the period of her painstaking work. Dr. A. M. Tweedie has been carrying on the work since Miss Lewis' service and has made extremely valuable suggestions and alterations in the technic. My resident, Dr. H. G. Sloan, and members of my staff at Lakeside Hospital, Drs. Gamble, Eisenbrey and Pomeroy, have assisted in the clinical side. To the many suggestions of my associates and to their enthusiasm and resourcefulness in modifying and mastering the technic and compiling the tables I am under obligations.

The red corpuscle is covered by an exceedingly thin and delicate membrane which prevents the escape of its contents, the most important being hemoglobin. This covering is very susceptible to chemical or thermal changes in its environment. If impaired by such changes a part or all of the hemoglobin will escape and become freely diffused in the serum. The corpuscles then become proportionately paler, and if all the hemoglobin is lost there will remain only the frame-work of the cell—designated shadow cell or ghost.

Free hemoglobin may be detected in the urine and other secretions. If in quantity, it stains all the tissues, causing a brilliant jaundice. This process is known as hemolysis and the agents

causing hemolysis are known as hemolysins. Hemolysins may be roughly classified as inorganic and organic. Inorganic hemolysins are such chemicals as ammonia, soaps, ether—any agent that will change the isotonicity of the blood serum. Among organic hemolysins are normal blood and tissue juices of alien species, and certain pathologic human blood and tissue juices. In pernicious anemia, in certain fevers, such as typhoid, occasionally in chronic suppuration, and in other general diseases there is such a change in the blood serum that when the red corpuscles from normal individuals are put into this serum, hemolysis occurs. It may be asked at once why such hemolytic serum does not destroy the corpuscles of the patient *in vivo*. It may be that the corpuscle shares the universal attribute of living matter whereby it is able, to a certain degree at least, to adapt itself to its environment; then, too, conditions *in vito* are not wholly identical with those *in vivo*. A corpuscle having so adapted itself to its environment may itself become so altered that when it is again suspended in normal blood serum it may undergo hemolysis.

The medical importance, if any, that these facts may assume is determined by correctly answering the following questions: Is there a reliable technic for the determination of hemolysis? Are the changes in the serum and in the corpuscles thus produced by disease of a specific nature? Are they constantly present?

Many difficulties beset the technic. There are various inorganic hemolysins—a long list of chemicals. The blood must be drawn and kept absolutely free from these. Change in temperature markedly influences the result so that provision for absolute control of temperature must be made. As the corpuscles are very delicate, extreme care must be exercised in applying the mechanics of the technic. It is necessary that the technic be precisely carried out in obtaining the serum. Experience has shown that if the serum and corpuscles are immediately separated, either by drawing the blood in sodium-citrate solution or by immediate centrifugalization, the hemolytic reaction is either minimized or negative. The maximum reaction is obtained when the serum and the corpuscles are separated by clotting. The serum attains its maximum hemolytic power in about twenty-four hours. In securing normal blood one must bear in mind the fact that it is not possible to absolutely determine except by an actual blood-test whether a given individual's blood will react as normal. But if several supposed normals are used at the same time and are tested against each other as well as against the

blood of the patient, there is then but slight chance for error. Again, it has been shown that organic hemolysins are destroyed, hence rendered insert, by a temperature of 55° C. for ten minutes. Anticipating for a moment a part of what we shall say as to the results of our tests, we will now state that in every instance such temperature exposure destroyed the hemolytic power of the serum. The hemolysins of disease, so far as we have studied them, are of organic nature. Inorganic hemolysins, such as ammonia and other chemicals, are not influenced by heat. If, then, all the tubes of the entire test are made up in duplicate and one set subjected to a temperature of 55° C. for ten minutes, possible error from inorganic hemolysins may be excluded.

The test is determined by the result of suspending normal red cells in the patient's serum, and suspending the patient's cells in normal serum, as above indicated.

The technic in detail is as follows: Facilities required: a. incubator, b. refrigerator, c. centrifuge, d. sterilizer, e. one gross test-tubes, size one-half inch; twenty-four tubes, size three inches long, one-fourth inch inside diameter, f. test-tube racks made to hold seventy-two tubes, with each tube hole numbered consecutively in ink, g. glass beads for defibrinating the blood, i. several aspirating needles with stylets.

Comment.—These instruments should be cleansed in distilled water. The tubes to be set up in the test should be kept immersed in isotonic solution and taken out only when they are to be used. The large tubes are used in pairs, one for obtaining the blood for the cells, the other the blood for the serum. In the tube for the cells a glass bead is placed. Both tubes are then closed with cotton stoppers wrapped in close-mesh cotton cloth, sterilized, and set aside for future use. Needles are similarly wrapped in individual packages.

Obtaining the Blood.—The blood is drawn by aspirating a vein. The most convenient vein is usually the median basilic vein at the elbow. The field is scrubbed with soap and water, then thoroughly cleansed with sterile water or, better still, with salt solution. The arm is firmly compressed well above the elbow by bandage or otherwise to dilate the vein. The needle is then inserted through the skin into the vein. Into the tube containing the bead 3 c.c. of blood is collected and the tube immediately and continuously agitated for about ten minutes. Defibrination of the blood is thereby accomplished. Into the other tube is drawn 10 c.c. of blood. This tube is kept at rest in a slanting

position during the separation of the blood into clot and serum. The pressure from the arm should be removed before the needle is withdrawn; otherwise, a greater amount of blood than is necessary will ooze from the puncture in the vein. The further preparation of the blood consists in putting the defibrinated blood into a tube containing 20 c.c. .85% saline solution made up with distilled water. This tube and the one containing the clotted blood are now placed for approximately twenty-four hours in the refrigerator. Cold facilitates separation of the clot and serum and preserves the blood. The separated serum is pipetted off, put into a sterile tube and again returned to the refrigerator. In precisely the same manner blood is taken from three apparently normal individuals and subjected to precisely the same technic. At the end of twenty-four hours the supernatant fluid in the tube containing the corpuscles is poured off and 20 c.c. of fresh isotonic salt solution is added. When needed, the tube is gently shaken until the cells are in complete suspension.

Setting up the Test.—We then have the corpuscles and the serum from four individuals—the patient and three supposed normals. Using the smaller test-tubes, ½ c.c. of the serum of each is put into each tube. Duplicate tubes of serum are put up. One set is subjected to a temperature of 55° C. in a water-bath for ten minutes. These tubes are now placed in the refrigerator until they reach the same temperature of the tubes remaining. After the required cooling, all the tubes are taken from the refrigerator. One-half c.c. of cell suspension of A, B, C and D is now added to the serum of A, B, C and D.

Testing the patient with three normals requires the use of thirty-two tubes arranged as follows:

Tube	1.		Serum A + cells of A.
	2.	(heated)	Serum A + cells of A.
	3.		Serum B + cells of A.
	4.	(heated)	Serum B + cells of A.
	5.		Serum B + cells of A.
	6.	(heated)	Serum B + cells of A.
	7.		Serum A + cells of B.
	8.	(heated)	Serum A + cells of B.
	9.		Serum C + cells of C.
	10.	(heated)	Serum C + cells of C.
	11.		Serum C + cells of A.
	12.	(heated)	Serum C + cells of A.

13.		Serum C + cells of B.
14.	(heated)	Serum C + cells of B.
15.		Serum A + cells of C.
16.	(heated)	Serum A + cells of C.
17.		Serum B + cells of C.
18.	(heated)	Serum B + cells of C.
19.		Serum D + cells of D.
20.	(heated)	Serum D + cells of D.
21.		Serum D + cells of A.
22.	(heated)	Serum D + cells of A.
23.		Serum D + cells of B.
24.	(heated)	Serum D + cells of B.
25.		Serum D + cells of C.
26.	(heated)	Serum D + cells of C.
27.		Serum A + cells of D.
28.	(heated)	Serum A + cells of D.
29.		Serum B + cells of D.
30.	(heated)	Serum B + cells of D.
31.		Serum C + cells of D.
32.	(heated)	Serum C + cells of D.

The tubes are now placed in a thermostat at a temperature of 37.5° C. for two hours. At the end of this time they are again placed in the refrigerator for twenty hours. At this time the hemolysis may be determined. This, of course, is determined by the pink discoloration of the supernatant fluid and the condition of the sedimented cells. Accurate notes of all the cases are kept by the numbers of the tubes. The result is read off by members of the staff who have no knowledge of the identity of any of the tubes. These observations make up the tables here presented. Almost innumerable changes were made in the technic until the present was attained. The results are now fairly uniform. Observations were made upon many normals and many varieties of diseases. We shall to-day discuss the results of these observations, especially in the case of malignant tumors.

In 200 individuals without malignant tumors or infections there was no hemolysis; in 146 proven cases of malignant tumors hemolysis was observed in 84 per cent. In the last sixty-six cases tested by Dr. Tweedie 88 per cent. were positive. In fifty-one cases of infection, acute and chronic, hemolysis was noted in 6 per cent. Blood taken during hyperpyrexia in some instances showed hemolysis. In fifty-five cases of benign tumors there was

no instance of hemolysis. Hemolysis was observed in nine out of thirty-four postoperative tests. Recurrence was proved in all nine cases. In twenty-five tests no hemolysis was observed and recurrence has not been demonstrated up to the present time. Numerous postoperative observations were made during the time patients were in the hospital. As a rule, hemolysis began to diminish after ten days, and generally after three weeks entirely disappeared in the cases treated by complete excision. In cases of partial excision hemolysis has not disappeared.

Summary.—Hemolysis was observed in 84 per cent. of proved cases. The negative tests were for the most part in late inoperable cases. Positive tests in the absence of cancer were observed in chronic suppuration, certain fevers and syphilis. In every instance observed, heat destroyed the hemolysis. In all cases observed, hemolysis disappeared within three weeks after the apparent removal of all of the cancerous tissue. We may conclude that the hemolysin is organic because it is thermolabile, and that its origin is in the growth itself because it disappears after removal of the tumor. We do not regard this test as diagnostic, but as important evidence of maligancy. *The entire subject is in the stage of investigation.* We can as yet form no conclusion.

Discussion.

Dr. Roland E. Skeel, Cleveland.—I want to congratulate Dr. Crile on his admirable paper. I have been familiar with the work he has been doing in regard to technical physiology, and the knowledge he has displayed in doing this work shows how important is the physiologic in contradistinction to the anatomic surgeon; and while some of us may be able to do this work, it is only those with physiologic training who are able to get down to the fundamental facts in pathology.

It seems to me, along this line of work there are two important possibilities which may be developed, and that Dr. Crile deserves great credit for presenting this paper. First, while he disclaims any positive diagnostic reliability for his test, at the same time the very fact that 84 per cent. of the early malignant cases showed hemolysis, gives about as reliable evidence as any of our laboratory tests at the present day, if not more so; and it is again one of the evidences that while laboratory work may not furnish positive facts, it may in many instances become one of the most important factors in making diagnoses. Then, along the same line a little later, having demonstrated so far that a body or organ, whatever it may be that causes hemolysis, is present, Dr. Crile has before him infinite possibilities in the way of demonstrating the etiology and chemico-pathology of malignant growths.

I remember many years ago hearing Dr. Vaughan, who is one of the best physiologic chemists in this country, say that the great advance in medicine and surgery in the next twenty years (he was speaking nearly twenty years ago) would be along the line of physiologic chemistry. It seems to me there is to be another great advance along the lines of physiologic chemistry, in demonstrating the etiology and pathology of the condition which is present, but which is at present little or not at all understood. I think this Association is to be congratulated on having this epoch-making paper presented to it.

Dr. Miles F. Porter, Fort Wayne.—I would like to ask Dr. Crile whether he has carried out any of these experiments on the lower animals. It is well known that the domestic mouse is not susceptible to the grafting of cancer from the human, and it occurs to me along this line would be a more rapid way of arriving at exact facts concerning hemolysis in cancer cases.

Dr. Crile (closing the discussion).—In reply to Dr. Porter, I have not tried these tests on the lower animals. The suggestion, however, made by him is a good one, and certainly well worth considering.

INJURIES TO THE BLADDER DURING HERNIA OPERATIONS.

BY

R. E. SKEEL, M. D.,

Cleveland.

INJURIES to the bladder taking place during operation for the ordinary forms of hernia are of two distinct classes as pointed out by Bruner[1], in 1898. The first and probably least common takes place from the presence within the sac of the bladder or a diverticulum therefrom; or in the paraperitoneal form the bladder escapes along the side of the hernial sac and is injured when the latter is incised or ligated; or otherwise damaged when the neck of the sac is dissected away from the subjacent tissues. The most common injury, however, is probably due to traction upon the sac in an effort to ligate it as high up as possible, with the result that the peritoneum passing from the bladder to the pelvic wall is dragged into the incision carrying the bladder with it, where it is either ligated, incised or torn. Only the former type should be designated as hernia of the bladder, but both types are almost universally so treated in the literature. In order to properly cover the ground the title of this paper was selected to include both classes under proper nomenclature. As an example of a true bladder hernia the following short report is appended.

CASE I.—Florence M., aged five years, was seen in consultation May 1, 1908, during an attack of acute strangulation in a hernia which has been known to be present for a year, when her mother had noticed a small hard mass in the right femoral region which made its appearance rather slowly and when first seen by her physician was not reducible. A larger swelling occasionally appeared which could be reduced. Her previous history was otherwise unimportant. For twenty-four hours she had been suffering severe abdominal pain, had vomited and the bowels had not moved with enemata. There was no abdominal distention and the small tumor had increased markedly in size and become very tender so that palpation was quite painful. Upon examination two distinct masses could be made out. The tender body was

shaped like an ovary and pressure upon it started a sharp attack of vomiting. Steady compression such as is exercised upon a paraphimosis resulted in a rapid diminution of its size and after a moment or two of manipulation, it slipped back through the canal without gurgling, leaving the smaller irreducible portion outside the ring. All pain and nausea immediately disappeared and the child in a few hours was as well as ever. Two days later while the patient was awaiting operation it was noticed that the hernia became much larger when the bladder was full and diminished in size upon its evacuation. Operation showed the adherent mass to be omentum, as was expected, with a para-peritoneal bladder hernia at the inner side of the sac. The sac was ligated below the bladder, the ring merely sewed up and the foot of the bed kept elevated for two weeks. Convalescence was uneventful and there has been no recurrence up to the present time.

CASE II.—Mrs. R. M., aged thirty years, pluripara. This patient states that for some years she has had a small swelling in the right femoral region which has been diagnosed as a hernia, and for weeks at a time has been irreducible. When irreducible it became tender and somewhat painful but not sufficiently so to incapacitate her. She has a chronic bronchitis and during exacerbations the hernia is far more troublesome. When first seen she was having one of these acute exacerbations and I was unable to reduce the hernia. Operation was done some weeks later under nitrous oxide and oxygen but the hernia had previously reduced itself. A very small empty sac was found which was so narrow at the neck as to be almost obliterated, and it was not thought possible that this could be the sac of the hernia which was felt at the earlier date. A little deeper dissection revealed a second sac situated median to the first one, thin and translucent. Both sacs were included in one ligature and cut away.

The patient was returned to bed in good condition but complained more of pain than is customary. Six hours later she was still complaining bitterly of pain which was not localized but spread over the entire abdomen and there was a little tympany. Her pulse was normal in rate, but very soft and the visible mucous membranes were distinctly too pale for a patient who had taken gas. In casting about for a solution of her rather serious appearance I remembered that several large veins were encountered in close proximity to the second sac, and immediately

passed a catheter which withdrew a small amount of blood and no urine. An attempt to perform cystoscopy failed because of inability to inflate the bladder and the diagnosis of injury to that viscus was positive. Gas was again administered and a second incision through the right rectus revealed the pelvis full of blood and urine. This was sponged away and the bladder opening easily found and repaired in two layers. A drain was inserted, probably unnecessarily, down to the bottom of the pelvis and the wound closed. A retention catheter was placed and the patient made an uneventful recovery excepting for the supervention of a femoral phlebitis—a condition, by the way, which has seemed to me to occur rather frequently after this particular anesthetic. While this may have been primarily a hernia of the bladder it seemed to me quite evident that the bladder was drawn into the incision by traction upon the empty sac first found.

In the article by Bruner above mentioned all literature up to the end of 1896 was searched, and 181 cases of bladder hernia found reported, 128 in the male, forty-four in the female with eight unknown. In the male there were 122 inguinal, two femoral and four of other less common varieties. In the female ten inguinal, twenty-seven femoral with seven of the less common varieties, and of those in which the sex was not mentioned there were six inguinal and three others. The right side presented the greater number of these hernias especially of the crural variety, there being twenty-three on the right side to six on the left. Bruner also found that very few cases of bladder hernia had been reported in patients under the age of thirty and the decade presenting the greatest number was between fifty and sixty. Of this large number thirteen were diagnosticated and treated without operation and of the whole number of operated cases, five were diagnosticated before operation. In those cases in which exact observation had been made ninety-nine were first recognized at the time of operation and in twenty-two instances the existence of bladder hernia was unknown until after operation had been completed, when later developments proved that injury to that viscus had taken place. In the ninety-nine instances in which the bladder was recognized during the course of the operation it was injured in fifty-eight or more than one-half, many times being accidentally cut or torn before its recognition: having been mistaken for the sac eleven times and for tumor, cyst, omentum or lipoma at others.

In the twenty-two instances in which nothing was known of the existence of bladder hernia until after the operation was completed it was mistaken for the sac nine times, for a second sac five times, and for a lipoma twice, and six times nothing had been seen at operation which resembled the bladder. Most striking, however, is the large number of fatalities for of the eighty-one cases which he tabulates in which bladder injury was known to have taken place twenty-one died, or a fraction over 25 per cent., and thirteen of them could be laid positively to the bladder injury.

Following along somewhat the same statistical lines as Bruner, I have been able to trace 144 cases of bladder hernia, including my own, from the end of 1896 to the end of 1907, of which number eleven reported are indexed but the literature is not available for reference. Of the 133 tabulated, ninety-seven were male and thirty-six female. In the male there were ninety-four inguinal, two femoral and one of both varieties. In the female there were eleven inguinal, twenty-three femoral and two other varieties. The youngest was a year and a half old and the oldest eighty-two. The largest number, thirty-two, occurred in the fifth decade and there were thirty in the sixth, but the first decade had five. Of those cases 133 in number concerning which complete statistics were found the diagnosis was made before operation eight times and two of them were not operated. At the time of operation diagnosis was made 116 times; not until after operation nine times. In those cases in which the bladder was recognized at the time of operation it was injured in thirty-two, making a total of forty-one cases out of 131 operated cases in which the bladder was injured. Of the thirty-two in which the bladder was recognized and injured four died and the outcome is unknown in three. Of the nine instances in which the bladder was injured, but the injury was not apparent at the time of operation, three were first disclosed at the autopsy. Two others died in spite of the condition becoming known and four recovered. A comparison of these figures with those of Bruner eleven years earlier reveals several interesting facts.

Bruner was able to collect but 181 cases in the entire literature preceding the end of 1896 while 133 have been reported since that time with the literature available. Eleven case reports are made, the literature being for some reason not at hand, and incidentally I have seen mentioned a number of other cases with such vague statistics as to make them of no use. The reason for

this apparent great increase in the number of cases is partly those which usually apply to a little recognized abnormality when attention is drawn to it by one or more forceful papers such as those of Bruner(1) in 1898 and Moynihan(2) in 1901. Every surgeon is then on the expectant list and Moynihan mentions in this paper von Hacker's experience in which in 455 hernia operations only one bladder hernia had been observed while so soon as the order went forth to examine carefully for this feature in any hernia operation it was found six times in the next 187 Bassini operations. Again, and this has been emphasized by various writers, the present modes of operating especially upon inguinal hernia in which the canal is laid open gives opportunity for observing a beginning protrusion of the bladder wall covered by the median side of the hernial sac, and further, the more complete loosening of the sac up to its neck together with the attempt to ligate as high as possible, undoubtedly in itself many times causes the bladder to present in the wound as an artifically produced hernia of that viscus. I am the more convinced of this because of the fact that in 131 operated cases the diagnosis was made before the operation in but six instances including my own, and it is hardly conceivable that it should have been overlooked in 125 cases had the condition existed before operation.

In Bruner's series the bladder was injured in 59.5 per cent. of the cases recognized as bladder hernia at the time of operation. In the later series the bladder was injured in but 27.6 per cent. of those cases first recognized at the time of operation showing again that operators were put upon their guard in respect to this complication and were recognizing it before any damage had taken place. This is more completely proven by the fact that out of the total number of cases which he records 12 per cent. were first recognized at autopsy or at least not until after the abdomen was closed while this later series shows only 6.7 per cent. entirely overlooked at the time of operation. Again in Bruner's series out of a total of eighty-one cases in which bladder injury took place twenty-one died, a mortality rate of 25 per cent., not all attributable to the bladder injury. In the later series of forty-one cases of bladder injury nine died, a mortality of 22 per cent.: not a particularly good showing when it is considered that the mortality rate for hernia operation *per se* is practically nil at the present time. It is altogether likely too that many deaths from this source are unreported; in fact, I have personal knowledge of one such and have no doubt that many of the Fellows could

narrate instances of which they know but which were never made public.

As to the etiology and pathology of bladder hernia I believe nothing more can be said than Moynihan gave in 1901 excepting to insist upon the probability that a far larger proportion of the paraperitoneal form is artificially produced than has been suspected. The recognition of the bladder hernia and avoidance of injury to its wall is the most important consideration. In the intraperitoneal form no difficulty is apt to arise as no operator purposely opens a viscus contained in the sac. The extraperitoneal variety is more subject to damage as the bladder may be opened under the mistaken idea that it is the sac. The paraperitoneal form is particularly apt to be caught in the bite of the ligature with disaster following later. It has been stated that the color of the bladder wall and its great thickness should lead one to recognize it, but in many of the cases reported the wall was so thin that neither its consistence nor color was sufficient to put the operator on his guard. Of more use is the appearance at the inner side of the sac or suspected sac of a large amount of fat and the large veins which are almost universally present on the bladder fundus but in a difficult operation these may be entirely overlooked.

For the purpose of absolutely identifying the bladder when opened by accident I would advocate the routine use of methylene blue for a day or so prior to the hernia operation. Thus the urine could not be mistaken for serum nor the thinned out bladder wall for sac. While such a procedure may seem unnecessary, nevertheless, since the common forms of hernia are so readily cured by the simplest of operations and the risks of such operations have been reduced to those purely accidental it seems incumbent upon us to reduce these accidental complications to the vanishing point by any means which may be possible.

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2. Moynihan. *The Lancet*, 1900.

DISCUSSION.

Dr. Joseph H. Branham, Baltimore.—This paper is one of great interest, and, as the author very well says, there is no question but what there are a great many cases of hernia of the bladder that have not been detected during operation, and have caused death afterward, and these cases often are not reported. I know of several such cases that were not reported, as naturally an accident of this kind does not enthuse the operator to place it before the medical public. Of course operators neglect to report these cases because they do not make quite as much effort to do so as they do other cases that are successful. I do not pretend to say they intend to keep them a secret, but a large proportion of them do not find their way into the literature.

On the other hand, a great many cases that are operated on successfully are not reported. I have run across two cases of hernia of the bladder in operating. I did not operate in a hurry. I believe there is some advantage in not being in a hurry or in trying to rush an operation too much. Operating slowly in these cases and finding what looked like an extra sac closely adherent toward the inner side of the hernia, I simply took a curved catheter and succeeded in passing it into the bladder and around into the sac. I would suggest this method of recognizing a hernia of the bladder as being very much superior to the methylene-blue method. I believe if we would carefully examine the bladder in each case of hernia before operating, we would find all diverticulæ extending into the hernial sac, and it would not be necessary to use methylene blue.

Dr. W. N. Sprague, Washington (by invitation).—In determining the presence of a hernia of the bladder in this class of cases, I had the opportunity some twelve years ago of seeing a case of this nature, making use of the ordinary uterine probe to determine the presence of the hernia, and was able to demonstrate it easily. I found, when I got down to the hernial sac, there was thickening of the median side, and suspecting it might be a hernia of the bladder, it being the first case I had ever seen, I used the uterine probe and demonstrated it very easily. Since that time I have in every suspected case of hernia of the bladder used the uterine probe with which to explore the bladder at that point, but have not encountered a second case of hernia of the bladder.

Dr. Hugo O. Pantzer, Indianapolis.—I recall a recent observation which bears interestingly on this subject. A general surgeon operated upon a spare individual having a femoral hernia, with very slight protrusion, but very adherent sac. The operation by the surgeon was followed with an abdominal operation done by me. When I opened the abdomen, I found

the peritoneum of the entire right half of the pelvis denuded—in other words, the inordinate pulling out of peritoneum for the purpose of doing high suture, as mentioned here, had drawn down the peritoneum of that half of the pelvis and brought it out into the wound. Afterward the suture under high strain had slipped and here I had a large denuded surface. I am confident that the frequency of hernial protrusion is in large part due to the inordinate effort to strike the peritoneum at a high point.

Dr. Albert Goldspohn, Chicago.—In two instances of inguinal hernia in the male in my hands, a suspicious pouch appeared in the wound, which was proven by the introduction of a male sound to be the bladder. Of course, after its recognition it was successfully avoided from injury. In another instance I made bi-inguinal shortening of the round ligaments, or inguinal laparotomy, the operation having been done for complicated, severely adherent retroverted uterus; after breaking up adhesions with the finger through the inguinal canal and doing some resection of the appendages, then shortening the round ligament by drawing it more directly forward, and anchoring to the posterior surface of Poupart's ligament, it developed on one side that the patient had leakage of urine from the wound the next day. It was not serious, in that it did not lead to any evil consequence, and it ceased of its own accord within two weeks. But it shows what may occur, and in this latter case, where extensive adhesions existed, it can be easily seen that the bladder may be found adherent to and up to the round ligament.

Dr. George W. Crile, Cleveland.—It seems to me that Dr. Skeel has covered the subject very thoroughly in this timely and admirable paper, and I simply want to add to his statistics. Dr. Lower, my associate, and myself in over four hundred operations for hernia have seen five cases of hernia of the bladder, and in two of these I opened the bladder myself in operating.

One was the case of a little girl, nine years of age, who had a femoral hernia. The child was operated on previously by a colleague. In operating I opened the bladder, but sutured it. The healing was not interrupted.

In another case I opened the bladder, but if I had had my mind opened to the possibility of this accident, I should not have made the error, because afterward I questioned the patient closely about his symptoms; the urinary symptoms were distinct, and the clinical history would have shown that he had a bladder hernia. In this case the bladder was immediately sutured and a good recovery followed.

Dr. Robert T. Morris, New York.—Did I understand Dr. Skeel to trace the causal relationship between femoral phlebitis and the form of anesthetic—gas anesthesia?

I have not opened the bladder in hernia operations, but have opened it twice elsewhere, accidentally, once in removing fibroids

and once in a case of ovarian cyst, and in both of these cases by putting a catheter into the urethra I found there was a subsequent flow of urine in the line of least resistance, hence there was no complication resulting from opening the bladder.

Dr. Walter C. G. Kirchner, Saint Louis.—Unfortunately, I did not hear all of Dr. Skeel's paper, but he has brought before us a very important subject. I have come across such cases as he has mentioned. In the City Hospital of Saint Louis we have a great number of hernia cases, but I have only come across one case of hernia of the bladder. In this particular instance there were three rings which, of course, I recognized later. The larger one was in the position of what would usually be represented by a direct hernia; the outer one corresponded with the internal inguinal ring, and there was a small compartment in between. The larger and inner one contained the bladder. This I did not recognize until the bladder was opened. A catheter was passed into the bladder, and it was found that the bladder extended on the left side to within two inches of the crest of the ilium. This hernia had existed for some time, and the ring being large the greater portion of the bladder was drawn to that side. The bladder was repaired, the true hernia also looked after, and the abdominal wall strengthened. A complete and satisfactory recovery was obtained. It is the only case of this nature that has come to my attention.

Dr. Skeel (closing the discussion).—I fully agree with the gentlemen that in a true hernia of the bladder there is no difficulty in making a diagnosis by passing a sound into the bladder. Also, in true bladder hernia there should be practically no difficulty in making a diagnosis before operation. The point I tried to make was that the greater number of all so-called bladder hernias are produced during the operation by traction on the neck of the sac in ligating the sac high up. We slip the ligature a little higher in the effort to get it up as high as possible, and if we have pulled the peritoneum covering the fundus of the bladder into the hernial sac, slipped a ligature up above that, snipped it off, and also snipped the bladder protrusion off, we will have artificially produced a bladder hernia in which we have damaged the bladder wall. So soon as the bladder fills, it will drag back from the ligature, there will be an opening into the free peritoneal cavity, and it will soon be full of blood and urine. If we had administered something like methylene blue we would be able to see the stump afterward and recognize at once we had cut the bladder. It would be a comparatively simple matter to give methylene blue as a routine measure before hernia operations. If we have a plain straight case of bladder hernia, no one would blunder in the course of operation unless it were without thinking about the matter. It is this paraperitoneal form which comprises more than nine-tenths of all injuries of the bladder and are reported. I was careless in incising the bladder and tied it off with a ligature, then cut it off, and thought the urine was serum that came

from the interior of the sac. When I found I had injured the bladder, my chagrin was marked, and that led me to look up the literature of the subject. I looked it up for consolation to see whether any other surgeon had been so foolish, and found a number of cases reported, largely from the German literature, and, in addition, I found that many of our most distinguished operators abroad pointed out that they had been unable to distinguish previously what they later found to be the bladder.

Moynihan does not believe that bladder diverticula play any part in these cases. A small portion of the b adder is drawn into the wound alongside of the sac; many times exuding urine has been mistaken for serum or for cyst contents in cases of femoral hernia, the most distinguished operators having made this blunder, and have done it because the sac lacked translucency, and because the muscular color of the bladder was not characteristic, hence they did not recognize the mucosa The enormous percentage of cases in which injury of the bladder was overlooked at the time of operation led me to look up this subject, and I found that a number of writers suspected they had injured the bladder during their operations; that while they had passed a sound, they failed to find any connection between the bladder and the sac which they had torn or cut. The probability is that in dragging down such a protrusion of the bladder wall, the opening had been made so small that they could not get a catheter into it, and thus they injured the bladder without knowing it. In the straight bladder hernia of the intraperitoneal form, no one would make the mistake more than once; he would recognize it and close it up. In the form produced in the Bassini operation, in the effort made to drag the sac down, a certain number of bladders will be injured which might be avoided by the simple routine measure I have suggested. It would be practically automatic, and would show at once what had occurred.

Dr. Morris asked with reference to gas anesthesia. I am glad he has referred to this. I believe the use of nitrous oxide gas and oxygen has been employed to a greater extent in the part of the country where I reside than anywhere else, compared to the population and number of operators. The use of nitrous oxide gas and oxygen in these operations is very popular in Cleveland, particularly in cases of nephritis; cases of bad organic heart disease, with failure of compensation; bad cases of bronchitis and bronchopneumonia. I am impressed, however, with the greater number of cases of femoral phlebitis following the use of gas as an anesthetic than from the use of ether. This is not based on statistics, but is merely a personal impression which one gets as he looks over the field.

Dr. Branham.—Did I understand Dr. Skeel to say that there is no such thing as a bladder diverticulum?

Dr. Skeel.—No, sir. I quoted B. J. Moynihan as saying that he had never been able to find a single thing which would lead him to think of the bladder diverticulum; that eventually,

when the case was proven at autopsy to have been an injury of the bladder, it was then a diverticulum artificially was produced, but that bladder diverticulum was a rare occurrence except in the presence of stone or hypertrophy of the prostate which offered great obstruction to urination.

Dr. Branham.—It seems to me, if the inference is drawn that bladder diverticulum does not exist, it would be clearly an error.

Dr. Skeel.—Bladder diverticulum as the cause of hernia has never been proven.

Dr. Branham.—Bladder diverticula do occur, and I use the term bladder diverticulum in the sense of an artificial traction diverticulum, which is perfectly legitimate, and not in the sense that these bladder herniæ are true bladder diverticula. Anyone who has studied specimens has seen them.

REPORT OF A CASE OF GASTRIC TETANY, OPERATION AND RECOVERY.

BY

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AND

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GASTRIC tetany is a grave complication of obstruction of the pylorus characterized by attacks of bilateral tonic muscular contractures beginning in the extremities and extending to the face, body and larynx. In this definition we wish to emphasize the obstruction of the pylorus as the anatomical cause for this particular variety of tetany. We deem this necessary, first, on account of the incorrect definition prevalent in the current literature; second, because this anatomical condition is one which can be relieved by surgical means and, third, because we wish to accentuate this form of treatment which will place the majority of these cases, formerly considered fatal, among the curable diseases. Until recently gastric tetany has been vaguely defined as tetaniform convulsions associated with dilatation or hypersecretion of the stomach. An analysis of the cases up to this time, as will be shown later, demonstrates beyond a doubt that a mechanical obstruction of the pylorus is the initial and causative lesion. The dilatation of the stomach, which is present in this condition, is as much a sequel of this obstruction as is the tetany itself.

This variety of tetany was first described in 1869 by Kussmaul in his classic publication on "The Treatment of Dilatation of the Stomach by a New Method—the Stomach-pump." In this work he describes a case of dilatation of the stomach in which severe attacks of tonic convulsions occurred. These convulsions began in the hands and feet and extended up the extremities to the face and body. The local spasms in the face and arms were reproduceable by mechanical stimulus. He discovered that stomach lavage would prevent many of these attacks as well as relieve the

accompanying gastric symptoms. The following case, bearing such a remarkable resemblance to this first case reported, testifies to the great value of permanently recording unusual clinical data in the literature.

REPORT OF A CASE.

Mrs. M. C., aged forty-eight, housewife.

History.—Family: father died of paralysis commencing in the fingers (?). Paralysis on the father's side of the family. Past: nervous prostration six years ago. Chronic ear trouble, earache, discharge, etc., intermittently all her life. Backache associated sometimes with polyuria which seemed to relieve the pain. Edema of the ankles when a girl. Personal: mother of four healthy children. One abortion without known cause at the third month. Menopause began three years ago. Scanty periods occur yet every four or six months; last one a week ago. Occasional hot flushes, and has been more nervous during this time. Present: duration a year and a half. The onset was gradual with the formation of gas in the stomach causing belching and occasional vomiting. These gastric symptoms were present only after certain diet (potatoes, beans and like starchy foods) and continued one or two months without causing any other marked discomfort. At the end of that time patient began to have a "heavy feeling" in the upper part of her abdomen.

The first convulsion occurred about three months after the onset. After eating some food "which did not agree with her" she had a feeling of distress described as "distention and discomfort" in her abdomen. This was followed by a very severe convulsion which began with a "feeling of stiffness, folding and clinching of the hands and a drawing down of the toes"; extending rapidly to the muscles of the extremities and involved the muscles of the body and trunk, but not the larynx. These spasms were very painful and lasted for three or four hours. At the end of this time the patient vomited, the vomitus containing a small amount of blood. During the seizure she had been given a number of hypodermic injections of morphine without relief. After the vomiting the tonic contraction of the muscles gradually relaxed, but the patient was left in a collapsed condition for over a day. Following this, attacks varying in severity recurred a number of times immediately after eating so that the patient soon began to associate these convulsions with errors of diet.

This led her physicians to use stomach lavage as the treatment for these attacks.

Since this was adopted, a year ago, the patient has been lavaging her stomach as frequently as eight and ten times a day. Whenever she would have any abdominal distress accompanied by numbness or stiffness of the fingers she would immediately introduce the stomach-tube and lavage her stomach or cause emesis. This has served to modify the severity and prevent a number of the attacks of convulsions. She has, however, had an occasional attack of a very severe nature, the last one continuing for two hours, occurring three weeks previous to the date of this examination. Her diet has consisted of milk, buttermilk and crackers exclusively for one year. The appetite has been good, but she has been afraid to eat anything except the above on account of being fearful of bringing on the attacks. No history of severe abdominal pain, hematemesis, jaundice or symptoms referable to other organs, except that given above. She lost fifty pounds of flesh during the last year.

Examination.—General: development and nutrition poor, absence of adipose tissue. Color: mucous membrane pale; skin subicteric; lips crimson; cheeks flushed; hands and toes slightly cyanosed; pulse 112, medium volume, decreased tension, regular rhythm, symmetrical, which compares well with apex beat; temperature 98.4; respiration 20. Regional: ears, eyes and nose negative. Mouth negative, except slight coating of the tongue. Face: eyes sunken, bony markings prominent. Neck: thyroid, slight diffuse enlargement. Heart and lungs normal. Abdomen: short and wide; slight relaxation of abdominal muscles. Concave epigastrium with protrusion in the umbilical region. Large peristaltic wave rolling across the abdomen from above downward from right to left in the middle segment. These appear three finger breadths above and three finger breaths below the umbilicus, disappearing beneath the right costal arch. They occur two to a minute. Splashing sound is present over this area and marked gurgling is heard on pressure to the right of the navel. Stomach tympany reaches to the lower border of this area three finger breadths above the umbilicus.

On inflation the greater curvature of the stomach extends to three finger breadths above the symphisis, and the lesser curvature two finger breadths above the umbilicus. Laterally, the stomach extends from the right to the left axillary line. A

skiagram of the stomach immediately after taking Reigel's bismuth meal practically confirmed the above findings of inflation of the stomach. No tumefactions were palpable before or after inflation. A squirting murmur is heard at the end of each peristaltic wave by auscultating over the right border of the above area. Liver dullness extends from the seventh rib to the costal arch in the mammary line on percussion. Lower border is sharp, surface smooth, not tender or pulsating. Spleen is not enlarged on palpation or percussion. Kidneys: entire right kidney is palpable and distinctly mobile on palpation; not tender. Left kidney not palpable. No other important findings in the abdomen. Vaginal and rectum examination negative.

Nervous system: all tendon reflexes markedly exaggerated. Conjunctival, corneal and pharyngeal reflexes present. No marked sensory disturbance. Trousseau's phenomena positive. Three or four minutes after constricting the middle of the arm the hand became considerably cynosed. At this time the patient remarked, without knowing the purpose of this examination, that the hand felt as it did when she would commence to have her convulsions. Very soon after this the fingers began to stiffen so that it was impossible to bend them; then the extended thumb began to be abducted into the palm of the hand. The flexors of the forearm began to contract gradually flexing the fingers in an extended position over the abducted thumb in the palm of the hand. The whole hand in this position was then gradually flexed on the forearm. Accompanying these contractures was a complaint of severe pain and the patient said that that was the position the hand assumed in the beginning of her convulsions, and that this spasm would gradually creep up the arm to the trunk and body. Immediately after the constriction was relieved the patient would grasp her hand and rub the same until the muscles relaxed, which would relieve the pain. Chevostek's and Hoffmann's signs were not typically present, but on tapping the face along the angle of the jaw and over the branches of the seventh nerve, occasional fibulary contractions would take place in the upper lip and around the eye. The tests for electrical irritability of the muscles and nerves were not made.

Stomach Analysis, April 10.—Stomach emptied without any previous preparation (no test meal). Patient had taken a cup of milk three hours, an orange three and a half hours and crackers four hours previously. No obstruction to the passage of the tube, contents easily procured. Color, greenish. General char-

acter, almost entirely fluid, containing fibers of orange and finely divided food-stuff. Chemical: highly acid. Congo, dimethylamidoazobenzol, Gunzberg and Boas tests positive. Kelling and Straus test (lactic acid) negative. Butyric and acetic acid negative. Free HCl, 20. Total acidity 80. Albumin button digested in twenty-four hours. Metts tube .5 mm. digested in twenty-four hours. Boas-Rennin test positive in dilution of 1 to 640. Pathological fermentation, very small amount in twenty-four hours. Benzidine and guaiac test negative. Microscopic: muscle fibers negative. Yeast cells positive in twos. Sarcinæ negative. Starch cells numerous. Fat globules many. Bacteria, many short rod bacilli; few other forms. Leukocytes and erythrocytes negative. Epithelial cells, few squamous.

Stomach Analysis, April 20.—Previous preparation, stomach lavage followed by scraped beef and milk toast fourteen hours previous to test meal. Ewald breakfast removed in one hour. Important findings, free HCl, 46. Total acidity 92. Albumin button digested in twenty-four hours. Metts tube .55 mm. digested in twenty-four hours. Boas-Rennin test positive in dilution of 1 to 640. Pathological fermentation negative. Microscopic: muscle fibers positive. Yeast cells in twos. Sarcinæ negative. Starch cells numerous. Fat negative. Bacteria, many short rod bacilli, gram negative. Leukocytes and erythrocytes negative. The findings of chronic hypersecretion could not be demonstrated as the stomach was empty in the morning after giving stomach lavage in the evening and allowing nothing by mouth during the night.

Animal experiments. (The stomach contents used for these experiments were not fresh, having been kept for several weeks before it was used for this purpose.) Guinea-pigs and rabbits were fed with the stomach contents without producing convulsions or any other noticeable symptoms. Subcutaneous inoculation in a rabbit with a filtrate of the contents caused death from sepsis without the production of convulsions. Two c.c. of an alcoholic extract given intravenously and subcutaneously produced no perceptible change in the rabbit.

Urine examination. Single specimen. Amount: 130 c.c. Color: dark yellow. Transparency: clear. Reaction: neutral. Specific gravity: 1026. Nucleo-albumin trace. Serum albumin, dextrose, bile, blood, indican and skatol negative. Microscopically, occasional hyaline casts and many squamous epithelial cells few polynuclear leukocytes.

Diagnosis.—Anatomical: benign stenosis of the pylorus, dilation and ptosis of the stomach, floating right kidney, slight parenchymatous goitre. Clinical: gastric tetany.

Operation, May 7, 1907.—Ether anesthesia, median incision. Examination of the stomach revealed a cicatrix encircling about three-fourths of the pylorus, causing almost complete obstruction of that orifice. No adhesions around the pylorus. Stomach greatly dilated. Walls marked hypertrophied. No other abnormal findings in the abdomen. Short loop posterior gastro-enterostomy, suture method, performed.

Course since the operation. Patient recovered from the immediate effects of the operation rapidly and, with the exception of a slight stitch abscess, made an uneventful recovery. Her diet was gradually increased to a solid diet which she was able to take without any gastric disturbances after three weeks. She gradually gained weight and since this time, now over a year, has been entirely free from gastric symptoms and has never had a recurrence of spasms or convulsions. An attempt was made to demonstrate Trousseau's phenomena three days after the operation without success, and since this time this sign has not been able to be elicited.

OCCURRENCE.

That gastric tetany is a rare condition will be surmised by referring to the bibliography giving the authenticated cases obtainable. Gumprecht collected forty cases reported up to 1897. Reigel was able to collect only twenty-seven cases up to 1903, of which sixteen proved fatal. Boas refers to thirty-five cases found up to 1907. The largest number of cases compiled was by Edwards who collected 101 cases combined from Reigel, Albu, Frankel-Hochwart and others.

PATHOLOGY.

The pathological lesions present in this disease have been variable. An analysis of the cases reported up to the present time, however, establishes a common functional result caused by these lesions—that of mechanical obstruction of the outflow of the stomach. The following lesions have been reported as the etiological factor producing this obstruction: 1. Cicatricial stenosis of the pylorus due to a previous gastric ulcer has been found in a majority of the cases (Kussmaul, Gumprecht, Fleiner,

Caird, Cunningham and others). 2. Malignant stenosis due to carcinoma (Kuchinan, Jeurgensen, Seivers, Boas, Reigel). 3. Sarcoma of the pylorus (Fleiner). 4. Compression of the duodenum by gall-bladder filled with stone (Blazicek). 5. Compression of the duodenum by pancreatic cyst (Berlitzheimer). 6. Torsion of the stomach (Miller). 7. Foreign body in the stomach (Warbasse). Besides these causes, 8. Entozoa (Reigel) and 9. Chronic diarrhea (Ewald and Jacobson) have been found associated with this form of tetany. Strictly speaking, however, if we are to define gastric tetany accurately, we cannot include the latter two causes. They are intestinal and not gastric lesions, and it would be more proper to term these cases "enteric tetany." With the exception of these latter two, the pathological lesion in every case has been one which has caused mechanical obstruction to the motility of the stomach, and we feel justified in affirming the conclusions recognized by Germain-See and Berlitzheimer, namely, that this mechanical gastric disturbance is the most important etiological factor. This lesion need not be limited to one of the seven above, but might be any other intrinsic or extrinsic process causing chronic obstruction of the pylorus or duodenum. No other important lesions are reported. Loeb has described kidney, and Feranini brain lesions which were apparently the result of toxic influences.

Pathogenesis.—Three theories have been advanced to explain the cause of these convulsions: 1. desiccation of the tissues; 2. reflex irritation, and 3. autointoxication. Kussmaul attributed the convulsions to loss of water and consequent desiccation of the tissues. This theory might be applied to what we have called enteric tetany due to chronic diarrhea. Miller and Reigel describe cases in which the convulsions have been produced by mechanical irritation of the stomach, and Miller supported on this ground the theory of reflex irritation. As these two theories have practically been discarded, we will not consider them further. Many French and German authors have endeavored to establish Bouchard's hypothesis of autointoxication. Toxic substances, peptotoxins (Bouberet and Devic) and diamins (Kulneff) have been isolated from the stomach contents of these cases which, when inoculated into animals, produced more or less typical attacks of tetanic convulsions resulting in the death of the animal in some of the experiments. Alkaloidal bodies have been isolated from the urine (Ewald, Jacobson and Albu) which were afterward not present when the patient had recovered from this

condition. These bodies have produced tetanic convulsions in animals in some instances, but not in all the cases or exper ments. These experiments, then, while they are suggestive, have not absolutely established a theory of autointoxication. On the contrary, Cassaet and Ferre were able to isolate substances from gastric juice of persons not suffering from tetany, which would produce convulsions when inoculated into the animal. Fleiner and Gottleib employed the peptotoxin manufactured after the manner of Bouveret and Devic and produced a clonic contraction of the animal, but not the tonic variety of contractions resembling tetany. The experiments of Gumprecht, Haliburton and McKendrick with these extracts of stomach contents and urine were unsatisfactory.

CLINICAL COURSE.

In discussing the clinical course of this condition it is necessary to consider both the developing gastric symptoms and the terminal characteristic attack of convulsion. The abdominal symptoms will depend entirely upon the kind of lesion producing the obstruction of the plyorus. We cannot go into detail regarding the symptoms of these numerous lesions as each has its own peculiar clinical picture. No matter what the lesion may be, however, the clinical course and findings of a high grade of motor insufficiency of the stomach is usually presented. These symptoms and signs combined with the characteristic convulsions of tetany, the same as due to any other cause, produce a fairly classical and simple picture of this very serious disease. In the majority of cases the attacks of convulsions were usually preceded by prodromal symptoms in the abdomen referable to the stomach, such as fulness, distention, nausea, gastralgia and the like. The onset of the convulsion is usually sudden, beginning with sensory disturbances in the hands and feet, which are soon followed by spasms of the distal flexor muscles, extending rapidly to the muscles of the extremities and body. The slightest convulsive phenomena are those of creeping, numbness, formication and slight tonic contractions, particularly located in the hands and face. These slight symptoms may be present for a long time without developing into the classical convulsion or they may immediately precede a typical attack of a generalized convulsion. For this reason such symptoms associated with gastric disturbances should always lead to a careful examination of both

the stomach and the nervous system. Ury describes attacks of tetaniform convulsions in the extremities without the presence of a generalized convulsion, which were associated, however, with more or less disturbance of consciousness. Cases have been described in which the clinical picture varied between tetany, tetanus and epilepsy. In some of the cases of a favorable course temporary disturbances of the intellect, loss of memory, disturbance of vision and speech were present. Unconsciousness for a varying length of time occurred in some of the graver cases reported.

Trousseau classifies three different degrees of tetany according to the extension of the convulsion: 1. a mild type, in which all the muscles of the extremities are seized; 2. a medium type, in which, besides the above, muscles of the trunk, body, abdomen and face are involved, and 3. a grave type, including the muscles of the larynx, pharynx and tongue. The pathognomonic sign of tetany convulsions, which differentiates them from convulsions due to other causes, is the fact that some of them can be reproduced by mechanical or electrical stimulus during the interval between the attacks. Symptoms referable to other organs are those due to inanition and those produced by the special lesions causing obstruction of the pylorus. Imbert-Gourbevre, Belpech and Rabaud observed that albumin urea was present in fatal cases.

DIAGNOSIS.

The positive diagnosis depends upon demonstrating, first, the finding of an obstruction of the pylorus and, second, characteristic muscular contractures, some of which are reproduceable by mechanical or electrical irritability and excitability. The diagnosis of obstruction to the pylorus in these cases is usually easy, because the stenosis has reached a high degree before the convulsions occur. In the majority of the cases food remains, which had been taken from twelve to fourteen hours previously, were found in the stomach or vomitus. The kind of stenosis must be determined from other clinical data, which space forbids us to consider at this time. Diseases which might be confused with this condition on account of similar gastrointestinal symptoms are especially the gastrointestinal neurosis associated with abdominal ptosis. These do not present the clinical picture of second-degree motor insufficiency of the stomach, nor do they

have the severe muscular reproduceable spasms which is characteristic of tetany.

The demonstration of the characteristic convulsions of tetany, which are the same in this variety as those due to any other cause, is made by eliciting the following pathognomonic signs. These signs are present during the intervals between the attacks of convulsions:

1. Trousseau's phenomenon or the mechanical irritability of the nerves. This sign is produced by constricting the arm, which causes the typical contracture in the hand and forearm. Whether these contractures are due to pressure upon the nerve or the bloodvessel is yet an open question. In our case we believe it is due to compression of the vein, because the contractures in the hand did not occur for three or four minutes after continuous pressure had been made over the nerve. The contractures did occur constantly about one minute after the hand had become markedly cyanosed.

2. Chovestek's and Hoffmann's phenomenon or mechanical superirritability of the facial nerve. This sign is elicited by tapping the branches of the facial nerve which produces a contraction of the muscles supplied by the individual branch of the nerve thus irritated.

3. Erb's phenomenon, or increased galvanic and faradic irritability of all the motor nerves except the facial. According to Frankel-Hochwart, this phenomenon cannot be entirely accepted. He maintains that there is an increased galvanic irritability present in all the cases, but that the faradic irritability is normal in the majority and only increased in a few.

Other diseases which must be differentiated from gastric tetany on account of having convulsions similar to this affection are hysteria, epilepsy, occupation neurosis, acroparesthesia, meningitis, brain tumor, rickets, thyroid and parathyroid affections, acute infections, nephritis, intoxications (ergot, morphine and lead), eclampsia and tetany occurring during the puerperium and lactation. Thirty-two cases of tetany occurring during the puerperium and fifteen cases of tetany due to syphilis (Howard) have been reported. All of the above conditions are easily differentiated from gastric tetany by: 1. the absence of positive signs of pyloric obstruction; 2. the absence of three cardinal pathognomonic signs of tetany, and 3. by the clinical symptoms peculiar to the individual disease under consideration.

PROGNOSIS.

The prognosis of gastric tetany has always been considered very grave. The mortality under medical treatment up to the present time has been 88 per cent. The cases reported by Kussmaul, which were treated in this way, resulted fatally. Slotau Fenwick reported a case in which death took place after sixteen hours of tetany during the first seizure. Bouveret and Devic gave the mortality as 70 per cent., and Meumann's estimation of the mortality in his report was 72 per cent. Until the surgical treatment was introduced nearly all the cases died in one of the attacks. Since this treatment has prevailed the mortality has been reduced to 37.5 per cent. The prognosis of the individual case depends necessarily upon the nature of the lesion producing the obstruction of the pylorus. If this is a malignant obstruction, as has been the case in about 10 per cent. of the cases reported, the prognosis is necessarily very unfavorable even under surgical treatment. As the majority of these cases are due to lesions which can be relieved by surgical intervention, the present mortality should be greatly reduced, providing the condition is recognized before other counterindications for operation arise.

TREATMENT.

Prophylactic treatment of this condition is very important. It deals with properly caring for these lesions before they cause serious obstruction to the pylorus. This is another argument for a radical surgical treatment of chronic ulcers, cholelithiasis, etc. The nature of the pathological lesions precludes a curative medical treatment. Symptomatic treatment, however, during the attacks must be given expeditiously. This consists of stomach lavage, hypodermoclysis, proctoclysis and morphine hypodermically. Radical surgical treatment, depending upon the lesion present, is the only rational treatment that should be considered. This was first advocated by Mayo Robson, who has reported three cases cured by this means. Fleiner (two cases), Gumprecht and Caird have reported cases due to cicatricial stenosis of the pylorus which have been cured by operation. Cunningham has collected eight cases and Warbasse has collected six cases which were also cured by this method. Jennosco collected eleven cases which had been operated upon with eight recoveries. The operation of election depends necessarily upon the conditions

present in the individual case. In the majority of the cases operated upon successfully pyloroplasty or gastroenterostomy was performed.

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DISCUSSION ON THE PAPER OF DR. BROWN AND DR. ENGELBACH.

DR. JOHN F. ERDMANN, New York.—I think we owe Dr. Brown a vote of thanks for his excellent exposition of gastric tetany in particular, and in addition to what has been said, I should like to report a case that occurred in my practice within the past two years.

The patient was a child, five and a half years old. I was called to see it at half-past eight one Saturday evening. The history, as given, was as follows: the day before, the child had eaten a small portion of rice and fresh fish, and following this there were attacks of vomiting and convulsions which varied in intensity and degree as to length of time. Toward evening the convulsions became almost continuous. The previous history elicited was this: for a period of three years the child had manifested symptoms of tetany, also had convulsions of greater or less degree, and was taken to foreign countries for treatment, but with no further suggestions than that great care should be exercised as to the dietary. I was called by Dr. La Fetre, and was sent for with a view to opening the abdomen for intestinal obstruction of some nature. On investigation I found the trouble was not due to intestinal obstruction; but in examining the abdomen we found an area of dulness on percussion which extended to the entire left half of the abdomen and to a portion of Poupart's ligament, passing over the median line, coming up within close range of the umbilicus, with an area of tympany superimposed upon that which extended to the epigastric space. The child had been chloroformed two hours and a half previous to my visit. As the result of the condition the child was in, spasms occurring, a catheter was passed through the nose, and a large quantity of fluid withdrawn, with a considerable amount of gas. I washed out the child's stomach, and during the period of washing there was an ascent of this dilatation of the stomach, so that within twenty minutes the area of dulness diminished within three fingers' breadth to normal. The child recovered from that attack.

As to the subsequent course, I cannot state. The child developed pneumonia and empyema subsequent to that, and passed into the hands of a surgeon for removal of a rib; but I understand there were no further attacks up to within a period of six months from the time I saw it.

I am perfectly satisfied from the exposition of this subject given by Dr. Brown, that this child suffered from gastric tetany due to a gastric dilatation, but from what cause I do not know.

TREATMENT OF TYPHOID FEVER PERFORATION.

BY

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I HAVE operated on ten cases of typhoid fever in which perforation had been suspected. In nine cases perforations were found. Death occurred in two cases. In one case no perforation was found. The first death occurred on the operating-table. The second death occurred on the ninth day as the result of pneumonia complicated with secondary perforations and gangrene of intestine.

In the prognosis of typhoid perforation, the individual physical condition, power of resistance, character and virulence of the organism in the peritoneal cavity, age of the patient, time elapsing between perforation and the performance of the operation are important factors in determining the result. Perforation occurs in cases of all grades of severity, from the ambulatory to the hemorrhagic type. It is most common in those with severe infection. It is more common in the hemorrhagic than in the mild cases. It occurs in the so-called ambulatory cases of typhoid. The ileum is the common site of perforations; the majority occur within twelve inches of the ileocecal valve; the appendix and colon, respectively, are the next most frequent sites of perforation.

Bacteriological examination of the peritoneal fluid is an aid to prognosis, the streptococcus infection being more fatal than the typhoid or colon bacillus. The prognosis is more favorable in the young than the old—two to one according to Elsberg. Time is the most important element in the prognosis—the earlier the operation after the perforation the more favorable the result. Like gunshot wounds, the prognosis depends largely upon the time the operation is done. Perforation occurs in one-third of all deaths from typhoid fever—some authors place the per cent. over one-third.

The study of typhoid perforations is one of importance to which it is impossible to devote too much attention. It is a momentous subject, and it is incumbent upon us not only to

make ourselves intimately acquainted with its etiology and pathology, but with the diagnostic features which differentiate it from affections presenting a somewhat similar appearance. This is not always easy, but often the matter is simple enough to guide the physician to seek surgical aid.

Typhoid fever is to a very large extent a surgical disease, and if possible every case should be carried to a hospital, where prompt surgical aid may be had should it become necessary. The treatment of typhoid fever is, in fact, like guiding a runaway horse: keep out of the ditches and off the stumps and ninety per cent. or more of the cases will recover. Of the remaining small per cent., if turned over to a competent surgeon, he will save at least thirty-five, if not fifty per cent. of the perforating class.

Blake says, "The physician who makes a correct diagnosis of perforation and calls in the surgeon should receive equal measure of credit even if the operation is successful." His results show that at least one-fourth of the patients suffering from intestinal perforation can be saved by operation. Nearly all o the patients with perforation who are not operated on die, so surgical treatment of perforation is productive of good results. The percentage of recoveries would be even greater if a diagnosis of perforation could be made earlier after its occurrence. The most common time of perforation is between the fourteenth and the twenty-fifth days. In about ninety-two per cent. the perforation occurs between the second and the fifth week, inclusive. The earlier cases are probably perforation in a relapse; now and then perforation may occur without evidence of previous illness. Pain of some kind is present in seventy-five per cent. of all cases. In about fifty per cent. of the cases the onset is sudden and severe and of increasing intensity, localizing itself in a special zone. In about twenty per cent. of the cases the pain is of slow onset, with general distribution. In some cases no pain is complained of, and the usual symptoms of perforation are absent. Tenderness and rigidity are present in sixty-five and seventy-five per cent., respectively, of all cases; in some cases either one or the other may be wanting, rigidity especially may be absent in cases with rather a pendulous and relaxed abdominal wall.

There is a very wide variance in the reported statistics upon perforation in typhoid fever. Osler found about five per cent.; Fitz, six and one-half per cent.; Murchison, eleven and one-third

per cent.; Cushing, in thirty autopsies at Fort McPherson, found twenty per cent. Reports from several large hospitals variously give the per cent. from one to five.

There is no definite relation between perforation and the severity of the attack. It occurs in all classes of cases. There is a great variance in the size and shape of the perforation: they are found as small as a pencil point and large enough to take in half the circumference of the bowel. The large perforation may take any shape from oval to rectangular, owing to the character and extent of the necrotic process. Sometimes a perforation of the serosa is found without complete destruction of the other coats of the bowel. Perforation is generally found at the base of a small punched-out abscess.

Impending perforation due to the sloughing patches in the mucous and submucous tissues may be recognized by the grayish button-like nodules beneath the peritoneum. Often the impending perforation is protected by exudative adhesions that may circumscribe the extravasation, as is often noticed in the appendicular perforation. Sometimes, owing to the thinning process due to mucous and submucous slough at the site of Peyer's patches, the general cavity is infected and a general diffused peritonitis results when no perforation is found. The character and extent of the peritoneal involvement will depend largely upon the character of the infection. The more virulent, the sooner will the patient die, and often with very little evidence of peritoneal involvement.

Moynihan says perforation is generally found to have occurred in the last twelve inches of the ileum. In three hundred and sixty-two cases (Harte and Ashhurst) seventy-three per cent. of the perforations were found within twelve inches of the cecum. About 2.1 per cent. were found at a distance of three feet or more. In seven cases the colon was perforated, five in ascending, one in transverse and one in the sigmoid flexure. Meckel's diverticulum was perforated three times and the appendix eight times. The perforation is generally single; sometimes more than one perforation and, in rare cases, numerous perforations are found.

The chief points of diagnostic importance are the increase of pain and muscular rigidity. Pain is much less reliable than rigidity. In fact, a sudden tightening of the rectus on side of the lesion is about as reliable a sign of perforation as crepitation is of fracture. Mikulicz (who was the first to operate for gastric-

ulcer perforation) first operated for typhoid perforation, April 7, 1884, with success.

In many cases the patient is desperately ill and prompt recognition of the trouble and early operation is necessary. In many cases it is a race with death, and there are often anxious moments when it is questionable which will win. The chief difficulty in these cases is the question of diagnosis, and when in doubt an exploratory operation is advisable.

In arriving at the diagnosis, no one pathognomonic symptom is always present. Rigidity is more often found than any other symptom. Next to rigidity tenderness is of greater assistance in making a diagnosis than any other one symptom. The pain in typhoid-fever ulceration is slow and continuous and does not always increase in severity prior to perforation, and often even subsides after perforation. It does often increase after the perforation, and is not often well localized.

With appendicitis the same character of pain may exist, but it frequently begins suddenly—often it is the first sign of illness (for first twelve or twenty-four hours pronounced in the epigastric and umbilical regions)—and then becomes localized over the appendix. Exceptions, of course, exist. Sometimes appendicitis is mainfested by a general headache and boneache, with absence or with more or less fleeting abdominal pains, while with typhoid fever severe pain may be manifest.

Temperature is not a reliable guide, though a sudden drop may indicate abdominal complication. The pulse is not to be relied on in making a diagnosis. It may become weak and frequent, but not to a perceptible degree, except when shock is found. It usually remains stationary, except in shock, and after shock it returns to its previous state. Inhibited peristalsis may produce marked tympany; therefore, tympany has no special significance in perforation. The fluid effusion, however rapidly it may form, may not be recognized. It does not always so shift as to change the dulness from flank to flank according to position.

The effacement of hepatic dulness is given as one of the stereotyped signs of perforation, but it is equally as manifest both in intestinal paresis or atony as in perforation, and it is often difficult to say from which it occurs.

Blood examination is important in making a diagnosis of typhoid fever, but of little value in diagnosis of perforation. Marked leukocytosis is seldom present. Because of individual variations in resistive and reactive functions absolute count

of leukocytes, if taken alone, has but little value as a means of diagnosis, and no absolutely invariable single total amounts, or cell percentage, can be laid down as significant of definite conditions.

Scott and other authors say abdominal rigidity indicates peritonitis in the neighborhood of the anterior abdominal wall. Scott says rigidity is rarely present in typhoid except in children, and if one never operates on a flaccid abdomen he will never operate in the initial stage of typhoid perforation. I think muscular rigidity is more general than he thinks—oftener than seldom present in adults as well as in children. When the history points to acute appendicitis or intestinal perforation with a flaccid abdomen, either the history is misleading or the appendix or perforation is located where an attendant peritonitis cannot affect the abdominal muscles, namely, in the pelvis or high up under the liver. Abdominal tenderness does not always exist in the adult, but when it is present and its significance can be properly interpreted it is a valuable localizing aid.

If about the tenth or fifteenth day severe pain is experienced with tenderness near McBurney's point, the indications point to appendicial involvement, and an exploration is necessary. If the abdomen be opened before perforation takes place, the ulcerating appendix should be removed and the surgeon congratulated for removing the appendix before perforation; for an appendix so involved as to give rise to a local peritonitis will soon perforate. There is more or less effort on the part of nature to protect the impending perforation by surrounding and covering the site with exudation adhesions, which is much less successful in the movable ileum than in the more stationary part of the bowel—colon, cecum and appendix.

In one of my cases no perforation was found, but the appendix was very much inflamed and bound down by adhesive exudate, but not in such a way as to have limited the infection of the threatened perforation. On the lower border of the first inch of the ileum a large discoloration with thinning of the wall was found. I removed the appendix and drew the cecum up in such manner as to cover the ulcerating area in the ileum and stitched it over the ulcer, so that in case perforation should take place it would be protected. Where this is possible, it is, I think, safer than a covering of omentum. This experience, with like observation on dogs, has led me to believe that wherever practicable the large bowel should be used to cover weak places, impending

perforations and faulty bowel closure. The sigmoid, if so utilized, is a valuable aid to the pelvic surgeon.

The case of colon perforation was circumscribed and occurred in a patient from whom my brother, Dr. W. E. B. Davis, had removed the appendix four years previously. The perforations in ileum cases were not circumscribed, but the purulent effusion was diffused considerably, yet was not general in two cases, general only in one case; one was perforated at the base of the appendix, the perforation involving the cecum, and was localized, but not circumscribed completely by adhesions; the fourth appendix case was not perforated, but it was very much inflamed, swollen and bound down by plastic exudate. This was the case in which there was a large discolored and thinned area on the first inch of the ileum that would have ulcerated very soon—possibly did perforate against or into the protecting cecum that I had sutured over the ulcer area.

In one of my cases of perforation in typhoid, in which I found the infection circumscribed, there was an opening into the cecum at the appendicial base large enough to admit the index-finger. The appendix was not found and the abscess sac was drained. Many months later I operated on this patient to relieve the resulting fistula. On opening the abdomen I found a general miliary tuberculosis—the entire abdominal viscera being involved. In making dissection from above I found the transverse colon attached to the ascending colon with an anastomotic opening. When I discovered there was communication I did not think it practicable or safe to leave the ascending and transverse colon united, for fear the intestines might pass under the cleavage and give trouble. So, instead of leaving the union intact, I severed it and closed both openings in the colon in the following manner: the serosa, which was studded with miliary tubercles, was turned back and the musculature was turned in and approximated by interrupted sutures; then the serosa was brought together with continuous sutures, closing the abdominal wall with tier sutures without drainage. I confess I felt very uneasy and skeptical about the sequel with the entire serosa studded with miliary tubercles, but the result of the colon closure was good. The patient is well and in college.

One case had two perforations in the ileum. The patient had been sick for ten days, and gave a history of perforation of probably two days' standing. The case was Jack ————, fifteen years of age; had a pulse rate of 140 per minute; respira-

tion, 40 per minute, and had persistent fecal vomiting. I operated as soon as possible, and found two perforations in the ileum. One was about the size of a pencil, eleven inches from the ileo-cecal valve, and the second perforation, fourteen inches from the ileo-cecal valve, was the size of a pencil point, just large enough to allow gas to pass.

By reason of profound exhaustion this patient was lost on the table. I closed the intestinal perforations and completed the peritoneal toilet, but before the abdominal incision could be closed the patient died as if his heart had been chopped open with a hatchet. I opened the chest after the method of my brother, Dr. W. E. B. Davis, and massaged the heart, but was unable to get a single response.

On May 18, G. K., age fourteen years, was brought to my infirmary on the tenth day of fever with the history of increased pain in the umbilical region; with increased tenderness and with rigidity on the right side. Widal was positive—low blood count. I made incision through the outer border of the right rectus fascia, found two perforations, one four inches from the ileo-cecal valve and the second at the base of the appendix. Appendix was found imbedded in exudative adhesions surrounded by pus, but was with some difficulty removed. Pus was mopped out, both openings closed and wick drainage placed in lower part of incision. Recovery was prompt as in an ordinary circumscribed appendicial abscess.

The last case, a fatal one, Angel Stephen (Hungarian), age thirty-five, was brought to the Hillman Hospital, October 9, with typhoid fever. Symptoms of perforations occurred the morning of October 17. His blood count had been low. At this time the leukocytes were seven thousand, polynuclears six hundred; right rectus became rigid, with pain and tenderness in the right lliac region. The incision was made in the outer border of the right rectus fascia. A small perforation was found in the ileum near the ileo-cecal valve. The appendix was very much inflamed and just ready to perforate; the perforation in the ileum was closed and the appendix removed; the abdomen was drained and treated by the Murphy method. The patient did well until the twenty-second, when he developed pneumonia; on the twenty-fourth of October he became very much exhausted, temperature and pulse were both very high, and in a few hours he became unconscious. Blood pressure was one hundred and ten. He had a Hungarian friend who was

willing to act as donor, and I transfused him with blood until his blood pressure was raised to one hundred and forty, at which time he became conscious and expressed himself as feeling better. The patient did well for twenty-four hours. He died on the twenty-sixth, nine days after operation, with pneumonia complicated with secondary perforations and gangrene of the intestines.

All of these cases were drained, except the case in which no perforation occurred and the case of miliary tubercles at the second operation. Incision in the outer border of the right rectus fascia was made in each case. Pus was mopped out in one case, and drained through stab wound; in the other cases, except the last two, which were treated by the Murphy method—the purulent fluid was mopped out as well as possible and then irrigated by means of pitchers full of hot saline solution poured into the abdomen.

Each case should be treated on its own merits as to the anesthetic—local, general or none at all—and as to the location and character of the incision in the abdomen. A few cases are so ill that they should be operated upon without an anesthetic; but where a general anesthetic cannot be borne, a local anesthetic may be used. Where and when necessary to do more than a drainage operation, a general anesthetic is best. An incision through the right rectus fascia will in most cases afford ready access to the bowel involved, which may be extended up or down as the indications may require. If the exudate is general, that is diffused or spread all over the abdomen, or peritonitis is general, the incision should be made in or very close to the median line and should extend from the pubis to or above the umbilicus.

My experience in many cases of diffuse peritonitis, particularly in experimental investigation on dogs, has convinced me that the longer the incision, the better can all affected parts of the peritoneum be inspected and cleansed. Through a long incision one can better get at and close all perforations and get out. Allow the pus to flow out, and, when necessary, gently dip it out with sterile gauze sponges or swabs, and discard the sponges as fast as used. Add as little trauma as possible to the peritoneum: it will not stand for it. I will here emphasize, with borrowed expressions about septic peritonitis, as applicable in a large class of perforations of all kinds, especially in typhoid, that we should operate early, incise amply, repair carefully, manipu-

late gently, wash thoroughly perform rapidly, if possible close completely—if not, drain, thoroughly—and then narcotize deeply.

When the abdomen, with great gentleness, has been emptied of the septic fluid, first expose the cecum and appendix; next inspect the cecal end and then inspect the ascending and transverse colon; it is rarely necessary to inspect the jejunum, duodenum or stomach. Remove the appendix, if involved; close or repair the perforated bowel (if possible); then drain with gauze wick and rubber tube. While I think the Murphy method applicable to a large number of cases, in all of these except the last two and appendix case, I flushed the abdominal cavity with large quantities of hot saline solution poured from pitchers. I begin usually in the region of the cecum, and have the right side of the abdominal wall well drawn to the side, the intestines and omentum are lifted with the gloved hand, and the flushing continued until the cecal region is cleansed of all débris; then in like manner the gloved hand is carried down into the right pelvis; then to the left side of the pelvis; then up to the region of the sigmoid and splenic flexure and finally clear around the cavity, lifting and mobilizing the intestines in a way to make room for the hot flushing saline, without disturbing adhesions and adhesive exudate more than necessary. By mere inspection and by means of an irrigating tube it is not probable—hardly possible—to reach collections hid behind adherent intestine, but with one or both gloved hands the intestines may be lifted and mobilized with great gentleness.

In the experimental investigations upon dogs made by my brother and myself many years ago, we found that if the entire peritoneum showed gross changes (general suppurative peritonitis), its recuperative powers were not sufficient to prevent death; when one-fourth of the peritoneal cavity was not involved recovery was possible and did sometimes take place; when one-third of the cavity was exempt, recovery was probable, and when only one-half became involved, recovery was very certain. In a few cases I believe it is good surgery to close the abdomen after a thorough toilet of the peritoneum, especially when the perforation can be satisfactorily closed and a satisfactory toilet made. In cases that cannot be closed, and they constitute a large number, drainage wicks should be placed, either through the original incision or a stab, and stitched to either side of perforation with catgut.

The class of cases in which the infection becomes localized (walled off by exudative adhesions, whatever the size) should be drained. If the infection is mild the drainage will turn the scale in favor of the patient.

The distinction between diffuse suppurative peritonitis and large abscesses is so apparent that it would not necessitate an explanation, but for the fact that some excellent writers make no distinction and classify all purulent exudates as cases of free purulent peritonitis. Many cases of suppurative peritonitis have been reported which, if the truth could be known, were cases of large quantities of pus in the cavity, but have been circumscribed until near the time of operation. I have operated on many such. The question of shock following perforation in typhoid fever has received considerable discussion. As in gunshot injuries of the intestines, one can never know that the shock and extreme prostration may not be due to hemorrhage, and to wait for shock to subside is to wait for death. I believe in the earliest possible operation, even in the presence of profound shock.

The Murphy treatment of peritonitis is not applicable to all cases of typhoid perforation. Simple drainage, without mopping out pus and irrigating, is applicable to a large number of cases of peritonitis, but in typhoid perforation, where there is a large exudate of intestinal contents, general thorough flushing seems indicated. With the Murphy method, the abdomen should be opened over the seat of primary focus of infection, perforation closed and any other trouble corrected. A second short incision should be made above the pubis for the insertion of a large rubber drain down to the bottom of the pelvis. No effort should be made to remove pus by mop or flushing. The patient is placed in bed in exaggerated Fowler's position and secured by elevating the bed about fifty degrees and supporting the hips with a wood seat rest like that of Dr. Stewart McGuire. Physiological salt solution subdermically should be used when needed for failing heart, and proctoclysis continuously until sepsis is overcome. Transfusion of normal salt solution (in large quantities) or blood (Crile's method) should be resorted to in great prostration and exhaustion from hemorrhage. Morphine should be given for rest, sparteine, in large doses, for general stimulant and prophylactic against suppression of urine. Strychnine and digitalis are rarely given. Purgation should not be employed. Stomach lavage for nausea and vomiting

should be repeated at necessary intervals, and all food withheld until patient recovers sufficiently to retain and assimilate it.

The abdominal wall should be closed with through-and-through wormgut sutures in the cases drained through the incision. When a thorough peritoneal toilet is possible, suture of each layer separately with kangaroo or catgut suture is preferable.

To sum up the main points:

1. Typhoid fever is a surgical disease.
2. About five per cent. of typhoid fever cases perforate.
3. Nearly all perforating cases die if left to nature's resources.
4. A large per cent. may be saved by prompt operative interference.
5. Incision should be large enough for expeditious work, preferably through right rectus fascia.
6. Lavage with hot saline is essential in a large number of cases, especially when fecal extravasation has taken place.
7. If a perfect peritoneal toilet can be secured, abdominal closure may be made without drainage.
8. Treatment by posture (Fowler's position) to confine bacteria and septic material to lower abdomen is important.
9. Treatment should be directed to destroy or impede growth of bacteria already in the tissues and blood—antistreptococcus serum and ungentum Credé.
10. Elimination should be secured by physiological salt solution hypodermically when indicated for failing heart, and proctoclysis continually until sepsis is overcome.
11. Supportive treatment should consist in transfusion of salt solution or blood; strychnine and digitalis for heart stimulant; sparteine, in large doses, for general stimulant and prophylactic against suppression of urine; morphine should be given to control peristalsis and produce rest, control shock; and nourishment should be given as early as possible.

DISCUSSION.

Dr. Thomas B. Noble, Indianapolis.—To be brought into the presence of a patient suffering from typhoid fever late in the disease to do a laparotomy involves as heroic a thing as can be imagined. One must be sure of his diagnosis; sure as to

the rapidity of operative procedure; sure as to the character of the abdominal toilet; sure as to drainage, to mere suture, or excision. I know of nothing which confronts a surgeon which demands greater certainty in detail than this question—namely, perforation in typhoid fever. Anything, therefore, that will help us in making a diagnosis, that will aid us in treatment and prognosis, certainly is to be welcomed.

As to diagnosis, I would like to call attention to a point which has not been mentioned by the essayist in his excellent paper nor by others, but which occurred to me and helped me out of just such a difficulty—the matter of surety in diagnosis in a case not advanced, in which an unnecessary laparotomy would have been anything but desirable. I was able to settle for myself the extent of the perforation in this case by such means as I am going to mention, namely, the employment of an ampliphone, placing it over the area of greatest tenderness, and by making alternate palpation on either side I was able to elicit a friction sound such as we get in pleuritis. The same sound was produced by deep respiratory movements, a sound which indicated roughened peritoneal surfaces passing over each other, that roughening being due to an infection which we have reason always to believe must come from an impending or an already existing perforation. I have since demonstrated this sound or this symptom in other areas in the abdomen, in which I suspected a regional peritonitis due to an analogous pathology.

The essayist said that the prognosis depends upon the time in which we operate after a perforation of the intestine. That is very true, and I agree with him when he says that the earlier the operation by all odds the better for the patient, even though it be in the presence of shock. But there are other things that relate to prognosis, one of which must not be lost sight of, and that is the time at which the perforation has occurred during the progress of the disease. A perforation occurring at the end of the first week or during the second or the early part of the third week gives us an infinitely better prognosis than a perforation occurring late in the disease—after six or seven weeks of prostrating illness.

Dr. Miles F. Porter, Fort Wayne.—There are two or three points to which I would like to refer. First of all, I wish to emphasize what Dr. Davis has said regarding the advisability of operating in the presence of shock, and I would like to extend that advice to the vast majority of surgical conditions requiring operation, including traumatisms. My own candid opinion is that to wait for shock to subside is to add probabilities of a serious result.

Another point that I would like to emphasize is the advisability of operating not only in these cases, but in some others also for the purpose of making an exact diagnosis. The only diagnosis necessary in a case of this kind, for instance, is one of peritonitis. It does not make a bit of difference whether the

perforation has already occurred or whether it is about to occur, so far as the necessity for operation is concerned. These ulcerated areas leak sometimes and cause peritonitis before actual macroscopic perforation has occurred.

I have a case lying in bed now that illustrates a number of points in connection with this subject as to diagnosis, prognosis, and treatment, and particularly does it illustrate this point—namely, that the prognosis of the operation *per se* must be considered, and in connection therewith the prognosis of the condition or disease to which the perforation is due, together with the pathologic conditions caused by the perforation. What I mean is this: many of these cases will get along splendidly after the operation for perforation and peritonitis, but they will continue a typhoid fever course as usual, as this case of mine is doing now. It is something like seventeen days since the operation was performed; he has no trouble so far as peritonitis is concerned, but he is running a high temperature, which is due, in my opinion, to a continuation of the typhoid infection.

My own judgment is, that if we were to stop trying to find out exactly where a perforation has occurred or exactly what the pathologic condition is that has led to peritonitis, and simply operate on these patients as soon as we are convinced there is a localized infection of the peritoneum, which is always secondary and never primary, we would save more lives than we do now. The best method of making a positive diagnosis in these cases is by opening the belly and finding out.

Dr. Herman E. Hayd, Buffalo.—In view of the fact that Dr. Davis has recited in his cases a number of perforations, I would like to ask him whether it would not be advisable, in order to make a satisfactory exploration, to go over the whole bowel. We all know that perforation in the great majority of cases takes place in the region of the ileocecal valve. However, if we were to content ourselves with that, and not extend our investigation to exploring the ascending and transverse colons, we surely would overlook some of these perforations, which he met. Therefore, what brought me to my feet was a desire to ask Dr. Davis whether, in all these cases he has operated on or in cases he might be called upon to operate, he would extend the exploration to the entire large bowel, or to at least the ascending and perhaps the transverse colon and ileum? If so, it would make a long and necessarily a dangerous operation, and of course the prognosis would be very questionable. However, is a man justified in closing up the abdomen until he has made such an examination in view of his experience?

Dr. William A. B. Sellman, Baltimore.—My impression is that the sooner we operate on cases of perforation from typhoid fever, the more favorable is the prospect for saving life. I always instruct my interne to look out for shock in such cases, for sudden depression, and whenever it occurs to notify me at once. When these cases are allowed to go on for hours,

perhaps days, and develop that sepsis which has been spoken of, the prognosis is extremely unfavorable. It is the early cases that make for successful operations, in which the opening is small, and in which but a small amount of the contents of the bowel has exuded into the peritoneal cavity. The cases that we are compelled to drain are those in which a certain amount of sepsis has developed, where, too, there has been a considerable amount of sloughing, and in my individual experience the prognosis in these is very unfavorable. The sooner the surgeon reaches a patient and operates after perforation has taken place, the more certain he is that the patient will recover from the effect of the injury. Of course the size of the perforation will depend very largely upon the extent of ulceration. There may be only a small ulceration and yet a big opening, making it almost impossible to close it satisfactorily. No amount of intestinal suturing will make it a water-tight channel, and within a few hours afterward there will be a reopening. The sutures will not hold and you will have to drain secondarily, and here my experience has been very unfavorable. Hence, the sooner we reach these patients and the quicker we operate on them, when the shock first develops the more certain we are of carrying them to a successful termination.

Dr. John E. Cannaday, Charleston, W. Va.—There is one point I wish to make in regard to the treatment of these cases—namely, that many of them are eminently suited to the use of local anesthesia. When these patients are delirious or semi-delirious, and are pretty well loaded with the typhoid toxins, the sensibility to pain often is well blunted, and if we anesthetize the abdominal wall thoroughly with weak solutions of beta-eucain, novocain, or cocain, which is the more toxic, they will bear the operation well. We can make an incision of moderate length, and if we do not have to prolong the search for the perforation and should happen to strike the right place, we can easily repair the damage with a minimum amount of shock to the patient who escapes the shock of the anesthetic as well as its toxic effects.

Dr. Davis (closing the discussion).—As to auscultation as a means of making a diagnosis in these cases, it is very imperfect and unreliable. We have frequently demonstrated the unreliability of auscultation in gunshot wounds, particularly on dogs. Perhaps in one case out of twenty-five you will get the sound mentioned by Dr. Noble, and it is valuable when you are able to elicit it.

I was glad to hear what Dr. Porter said with reference to exploration as a means of diagnosis. It is the only reliable means of making a correct diagnosis.

As to the remarks of Dr. Hayd, with reference to extending the examination beyond the involved area in typhoid fever perforation, when we can definitely determine this area, it is generally not necessary to extend the examination beyond it.

I would remove the exudate and disturb the intestines just as little as possible. I mobilize the intestines just sufficiently to get out the exudate. I do not agree with Murphy that all of these cases should be drained and not flushed. In some of them there is an exudate which must be removed.

In the cases of general effusion, when I find an exudate distributed all over the abdomen, I examine all the viscera I possibly can, but in some cases it is not easy to determine the exact area or areas involved.

TYPHLITIS.

BY

JOHN A. LYONS, M. D.,

Chicago.

(With Two Illustrations.)

I HAVE had very positive ideas regarding the course attending inflammations of the ilio-psoas region, to the effect that the appendix was always primarily involved and that from it arose all the inflammatory troubles originating in this locality. That perityphlitis could not occur except as secondary to appendicitis was a most positive opinion so firmly fixed in my mind that it required just such a clinical picture as the following case presents to affect one iota of that view, much less to shatter its entire foundation and as I have erred in diagnosing the case, I shall report it and endeavor to show some of the difficulties encountered in differentiating between typhlitis and appendicitis, as well as between these and other similar affections.

CASE I.—In November, 1907, I was called to see M. McG., who was suffering from severe pains in the abdomen, accompanied with nausea, vomiting and faintness. The patient, aged sixteen years, was one of eleven children. He had measles when about three and whooping-cough at five years of age. For his age, he is undersized in every way, and from his general appearance I would have considered him rather delicate, but his mother claims he has enjoyed very good health, except that he was now and had been all his life addicted to enuresis of a very stubborn nature, wetting his clothes and the bed at all hours of the day and night. This trouble, as I shall later show, was not a habit; neither was it due to neglect or carelessness, but it could not in all this boy's life be alleviated by rest, by work, by persuasion, by medical advice or by chastisement, the mother in her desperation resorting to many apparently silly and even revolting means in her efforts to overcome the trouble. His father died before the birth of the child, probably from pneumonia superinduced by alcoholism. The father's parents, though old, are still living, both being very healthy. The mother's parents each lived to be over sixty years of age, and

just what diseases caused their deaths she was unable to say, but that there was no consumption in either parent she was quite positive. The mother herself has never been ill long enough to confine her to bed, except while giving birth to her eleven children, six boys and five girls, all at full term, all the labors being normal except the fifth, sixth and ninth, these three offsprings being born dead following difficult instrumental deliveries. This boy, she informed me, had always a good appetite; indeed, he was rather inclined to gluttony, and was subject to constipation.

His present attack began about a week previous with severe pain in the right iliac region, simulating the pains due to appendicitis and, like them, radiating to and indeed rather beyond the median line; the abdominal wall being quite tender, even toward the left side, immediately over the sigmoid. This zone of tenderness was noticeable all along the right side above the crest of the ilium and radiating posteriorly along the lumbar region toward the spine corresponding posteriorly somewhat to the anterior zone of tenderness. The cutaneous sensitiveness or hyperesthesia, called attention to by Sir Wm. H. Bennit(1) and also by Dr. George W. Crile,(2) of Cleveland, was present, but not to as marked a degree, I thought, as is usual in acute attacks of appendicitis.

J. B. Murphy,(3) quoting himself and F. Franke, reminds us that this symptom (hyperesthesia) is present in pseudo-appendicitis caused usually by a neuralgia of the iliohypogastric or neighboring nerves, following either alcoholism or a cold, but most often influenced by acute or chronic influenza. In such cases, however, Murphy's cardinal symptoms of appendicitis demanding operation are absent. These symptoms and the manner of their onset are: 1. sudden severe abdominal pain; 2. nausea and vomiting a few hours following onset of pain; 3. general abdominal sensitiveness, especially over the appendix; 4. elevation of temperature, especially to 102° or 103° F. within twelve hours after onset of severe pain—and just such signs and symptoms as these were obtained in this case.

When called, I was informed that during this last attack the boy had exacerbations of temperature accompanied by severe chills, from one of which he was suffering during my examination, the temperature being 103° F. Upon local examination it was quite apparent that there was an enlargement immediately over the ceco-appendicular region, palpation outlined a large

hard mass extending from just above the right Poupart's ligament to near the crest of the ilium. The patient exhibited marked leukocytosis and otherwise appeared dangerously ill. So, diagnosticating a ruptured appendicial abscess, I advised his removal to the hospital for immediate operation. This the relatives agreed to, and within an hour he was upon the operating-table. An incision was made immediately over the tumor, through the abdominal wall and including the peritoneum. After protecting the peritoneal cavity from further danger of infection by carefully packing with gauze strips and clearing away some of the abdominal adhesions, we found a perityphlitic abscess involving the entire outer wall of the cecum and freely discharging pus from the enormously thickened cecum wall into the iliopsoas region; the appendix, however, was normally situated, lying just above Poupart's ligament, its proximal end arising from the inner and healthy wall of the cecum, running under the cecum along the psoas muscle and its distal end just reaching to and about to be included in the inflammatory mass.

The abscess cavity was thoroughly cleansed, curetted, all gangrenous, loose and raw edges clipped away, the cavity packed with 5 per cent. iodoform strips. The appendix, after its mesentery had been tied off, was dissected at its proximal end from the cecum wall; the opening there made was turned in with Dawbarn's purse-string and inversion sutures and the abdominal opening was closed to the drainage strips, dressings applied, and the patient put to bed. The appendix was perfectly normal along its entire mucosal and peritoneal surfaces, excepting a very slight infiltration of the serosa beginning at the extreme distal end, plainly and positively showing that this effort to infect the appendix was originating at or from the perityphlitis.

After operation the temperature and pulse rapidly declined to normal. The pus discharged freely from the abscess cavity, but gradually diminished; the after-treatment consisted mainly of frequently changing the outer dressings, gradually removing the gauze packing, cleaning the sinus with hydrogen peroxide and swabbing its cavity with iodine. The sinus healed solidly and permanently, the patient being discharged cured on the fifteenth day after the operation, and nothing thus far has occurred to in any way retard his puny physique from rapidly developing into a robust manhood, which is indeed taking place. The change in this young man's appearance as well as in his general deportment since the operation, his mother says, is truly marvelous, and is

possibly due to a rather peculiar coincidence following his recovery from the typhilitis. The enuresis with which he was so persistently annoyed throughout his entire ife has never once recurred; he was instantly and completely cured of this annoying ailment, and I have tried to account for this in the following manner:

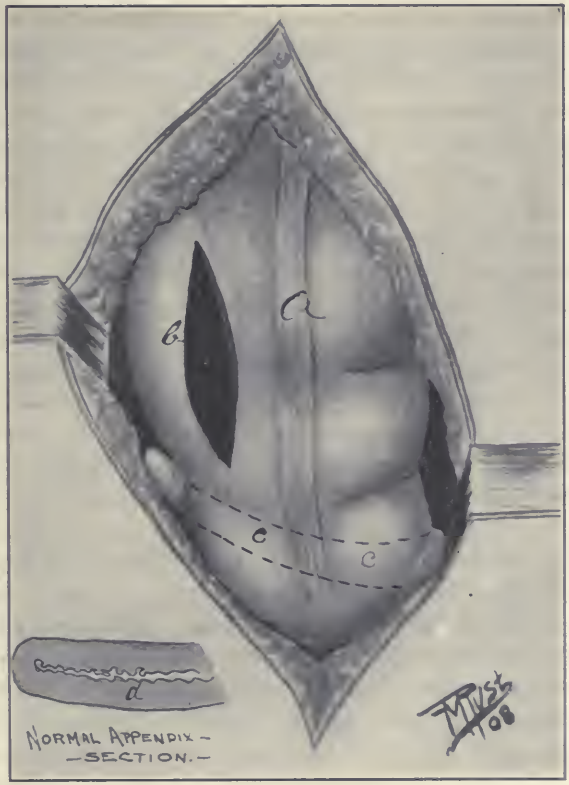

FIG. 1.—CASE I. *a*. Cecum. *b*. Incision into abscess. *c*. Location of appendix. *d*. Section showing normal appendix.

The superior sympathetic plexus of the sympathetic nervous system which supplies the cecum and appendix and which is involved in the radiating navel and abdominal pains, also the hypogastric plexus of the sympathetic nerves which supply the upper part of the bladder, may have had ganglia, as pointed out by F. Darwin (4), and in this case these ganglia sent sympathetic fibers to the different structures around the seat of inflammation

and also to the base and neck of the bladder, which, in turn, is taken care of by the fourth sacral nerve, and just as soon as the irritation caused by the cecal abscess to the Auerbach-Billroth-Meissner plexus and to all the sympathetic nerves involved, was overcome, so also was the disturbing element, such as tension or pressure to these sympathetic ganglionic fibers, removed by the cure of the inflammatory process, and the enuresis was immediately overcome.

All diseases, both medical and surgical, serve a purpose and teach their lesson, and this one to me indicates clearly that not only can typhilitis and perityphilitis take place entirely independent of appendicitis, but that appendicitis can and does occasionally occur secondary to or following typhlitis. It is not necessary, in order to have appendicitis, that the mucosa of the appendix be the initiatory seat of the inflammation, for inflammation of that organ may extend by continuity from a previous attack of perityphilitis to the appendicular peritoneum, and so continue until it involves the entire appendix; or a catarrhal inflammation of the cecal mucosa may precede and be the cause of a similar condition in the appendix, from which may follow periappendicular disturbances. That this question is yet unsettled may be inferred when one considers the multiplicity of opinions to be found in literature and elsewhere, both sides of which I will present impartially.

In a personal conversation with Dr. Byron Robinson, of Chicago, he asserted that there were twice as many retrocecal-peritoneal adhesions as periappendicular-peritoneal adhesions. This he has advocated for decades, he was daily proving it by personal observation at autopsies and at surgical operations. He said that the appendix was responsible for only about 25 per cent. of the diseases attributed to it. On the other hand, Dr. Alexander Hugh Ferguson takes as firm but an opposite position on the question of inflammations occurring in this region, he claiming that both typhlitis and perityphlitis are without doubt secondary diseases to appendicitis.

Dr. John B. Deaver(5) is exceedingly positive that a primary typhlitis does not occur, only as secondary to appendicitis, although on page 23 of his work on appendicitis he records Hoffacker's case (published by Gurling as early as 1836), in the person of a young student in whom, after death from abdominal disease, the autopsy showed inflammation starting in the cecum and colon and extending to the appendix.

Dr. Robert T. Morris(6) ignores typhlitis in his lectures on appendicitis, and just what his opinion is I could not determine. This, however, is quite common, as Bayard Holmes and many others seem to ignore cecitis while writing on inflammation in this region.

Osler says: "With rare exception we know that the cecum is not affected, and even the condition described as stercoral typhlitis is in reality appendicitis."(7)

Leube(8) says that while it was formerly believed that inflammations of the right iliac fossa originated in the cecum from catarrhal processes due to stagnating fecal masses, from which the inflammatory processes would extend, with or without the formation of pressure ulcers from the cecum to the adjacent peritoneum (perityphlitis), this view has been entirely abandoned, the appendix, it is now known, being primarily involved.

In the days of Ashhurst, Baum, Billroth, Czerny, Hagedorn, Howse, Julliard, Kocher, Kobert, Langenback, Ludwig, Madeling, Minier, Neuhauss, Perier, Ragenbouge, Wittelshofer, and especially Id, much pioneer work in the abdominal cavity was performed—the work that really has led to the present efficiency; yet their combined abdominal cases requiring laparotomy were recorded as being caused by intestinal obstruction, either acute, subacute or chronic, and these different forms of obstruction were attributed to 1. congenital malformations; 2. the impactions of foreign bodies, gallstones, etc.; 3. invagination or intussusception; 4. the twisting of the bowel upon itself; 5. stricture of the bowels, usually malignant in character; 6. inflammatory processes in the bowels resulting from fecal accumulations, fibrous bands or from injury; 7. chronic peritonitis, most frequently tuberculous in character; 8. abdominal abscesses due to compression or obstruction of the bowels from abdominal tumors of various kinds. In former years among the various causes of abdominal inflammation, neither cecitis nor appendicitis had been considered worthy of notice as a factor in the production of the various bowel troubles.

A question naturally arises, is it not possible that at this period in the history of abdominal surgery the cecum was partially and the appendix most thoroughly overlooked in the primary causations in at least half of the intestinal troubles of that day and age? Howard Kelly reminds us that during the early eighties and just previous thereto there seems to have been a period or decade of complete neglect of the appendix in its

relation to abdominal troubles, and Astley P. C. Ashhurst, to whom Dr. Deaver gives the honor and credit of writing the chapter on the history of appendicitis in Deaver's work on the appendix, credits Reginald Fitz's epoch-making paper in 1886 as the fulcrum upon which the appendix was quickly raised to its present high position in the surgery of the abdomen.

Pathologists incline more to the belief that the cecum is quite frequently and primarily involved. In Stengel's Text-book on Pathology,(9) 1908, he says that it may occur, but is usually secondary to appendicitis. He also says that appendicitis may result from primary typhlitis.

Tyson(10) (Practice of Medicine, 1906) says that in essentially all cases of cecitis the appendix is the root of the evil. Sir Frederick Treves(11) claims for the stercoral ulcer a definite position in the production of peritphlitis; just what a little fecal mass does in the lumen of the appendix, so does an impacted fecal mass in the cavity of the cecum cause a catarrhal condition of its mucosa, which may give rise to spurious diarrhea and may pass on to ulceration, which, if sufficiently deep, may perforate or produce peritonitis. Finally, he says, it must also be allowed that the appendix is frequently infected from a diseased cecum.

Dr. Howard A. Kelly(12) says stercoral typhlitis is now recognized as a rare affection; that it may occur, but is usually mistaken for appendicitis. But he calls attention to a statement by Voltz, published as early as 1846, which is to the effect that the condition known as perityphlitis is not primary, but consecutive to inflammation of the appendix vermiformis. He also gives Reginald Fitz's quotation in the *New York Medical Journal* (1886, vol. xlvii, p. 508), saying: "It is the duty of every physician to be mindful that for all practical purposes perityphlitis, perityphlitic tumor and perityphlitic abscess, mean inflammation of the appendix." In these words, in 1886, the era of the appendix began to reign supreme in inflammations of this region, and perhaps will continue so down to the end of time; yet Fitz was not biased, for he writes it is unnecessary to say that from a stercoral cecitis may arise an appendicitis (*Ann. Surg*, 1907, p. 856), and Dr. Kelly fearlessly reports fourteen cases in detail of primary lesions of the cecum in which the appendices were normal. Kelly makes it quite plain, however, that in order to show that the appendix was not primarily involved in typhlitis it must first clearly be shown that the appendix was perfectly normal.

Pozzi(13) reports a case o diagnosticated appendicitis in which after careful search no appendix could be found, but adhesions about the cecum were found and gave the same symptoms as would appendicitis. This was undoubtedly a case of typhlitis.

Resinger(14) found in 350 cases of perityphlitis two in which the cecum alone was involved.

Ross and Carless(15) claim that appendicitis is not infrequently associated with a true typhlitis, probably due to a chronic constipation, and as an explanation of this they say that the continuity of the mucous lining of the cecum and appendix would account for it, and because of this mucous membrane being alike in the cecum and appendix, a persistent typhlitis may follow removal of the appendix, and thus cause much disappointment in the nonrelief of symptoms.

Charles B. Lockwood(16) cites two cases of fecal impaction of the cecum which caused almost similar symptoms to appendicitis, although the appendix had previously been removed.

McWilliams(17) quotes Ochsner as saying: "There can be no doubt whatever in the minds of those who have had frequent opportunity of observing the pathological conditions present during the early part of the disease (inflammation of the right ilio-cecal region), by having operated during the first few hours after the beginning of the attack, that the disease always begins primarily in the appendix."

McNutt,(18) on the other hand, is quoted as saying: "The fact that appendicitis is a much more frequent disease than typhlitis is no reason for ignoring the pathology of cecitis."

John A. Wyeth(19) says that perityphlitic abscess demands operative interference as soon as the symptoms point to a collection of pus, and follows by saying that the inflammatory changes in perityphlitis are now understood to proceed in almost all cases from lesions of the appendix vermiformis.

Skene Keith(20) says the disease which was known as typhlitis and perityphlitis was in reality an inflammation of the appendix, at least in the great majority of cases, but with our present information we are not prepared to say that such a disease as perityphlitis can never exist without the appendix having first been inflamed.

Hemmeter(21) says there are instances of genuine typhlitis pure and simple, he having seen two such cases in which typhlitis was due to perforating cecal ulcer, and the appendix at necropsy in each case was normal. He says that, according to Porter,

Curschmann, Deuchmann and Kronlieu, the occurrence of primary typhlitis cannot be doubted. He also quotes Maurin, who studied 136 cases of suppuration of the cecal region, in which 95 were exclusively lesions of the appendix, 35 had involved the cecum alone, while 6 started from the cecum and appendix. Maurin showing in these cases that more than 25 per cent. had involved the cecum primarily.

I might quote other authorities in a similar vein. For instance, Hoche, of France, on "Typhlitis et Appendicitis," in the Revue Médicale de Lect. de Nancy, 1907; Schwierige, on the differential diagnosis between psoas abscess and perityphlitis, Aertzl. Prax., Berlin, 1907; J. A. Berry, on the "Cecum and Vermiform Appendix in the Outer Colon," *Med. Journal of Australasia*, Melbourne, 1907 Hartmann, on the "Surgical Forms of Ileo-cecal Tuberculosis," *British Medical Journal*, 1907; Davaris, of Constantinople, reports a case of typhlitis simulating appendicitis in the *Gazet Médicine d'Orient*, 1907.

Etiology and Pathology.—The anatomical peculiarities of the cecum favoring the accumulation of solids and gases liable to irritate are predisposing causes, so that abdominal trauma of any nature, such as blows, kicks, etc., may cause cecitis.

To Bayard Holmes(22) I am indebted for presenting the following as an etiological factor in appendicitis: The muscles of the cecum itself, he says, in forming the valve of Gurlach, apparently as a natural protection against the ingress of foreign bodies within the lumen of the appendix, yet that same valve congenitally constructed acts as a menace to health because of the ease and frequency with which it becomes congested and edematous, and because of this edema the normal appendicular secretions are obstructed and appendicitis naturally follows; even in a temporary colonic obstruction this valve may become congested and edematous, and after the colon has been cleaned out by cathartics, and the like, the valve continues congested, keeping virulent secretions blocked in its lumen, and the appendix, because of this constipation, becomes inflamed. In this same manner, I maintain the secretions of the appendix may be retained following a catarrhal or ulcerated condition of the cecum mucosa, say, for instance, near the site of the appendix, and caused primarily by the swallowing of some unmasticated and undigested material acting as an irritant to abrade or tear the mucosa, such as a sharp spicule of bone or other foreign body, and thus a catarrh of the cecum extend to the proximal end of the

appendix, this becoming a secondary affection to the catarrhal cecitis. I have had occasion to relieve several patients of such bowel contents, so formidable and so capable of injuring the entire passage from mouth to rectum as to leave the impression that any trauma, be it ever so slight, could have driven them through not only the mucosa, but almost through the entire intestinal wall.

This same argument will apply, but to a less degree, in the formation of compression anemia, brought out by Robert T. Morris, as a causation of infective appendicitis. Such isolated anemic areas, as he calls them, may be caused in a cecum impacted with feces and hard unyielding foreign substances, to which at this time is added either a blow, a twist or muscular compression from abdominal or psoas contraction, and the bowel bacteria of the cecum immediately invade and infect such area because of its lost leukocyte protection.

Byron Robinson(23) says the general etiology of perityphlitis is trauma of the psoas muscle, producing perityphlitic peritoneal adhesions, and these adhesions by contraction compromise the appendicular vessels (especially in the mesoappendix), and flex the appendix, checking drainage, and ending in secondary appendicitis.

Vigorous contraction and dilatation of the large arteries, such as the aorta and common iliac, when the cecum or appendix contains virulent microbes, may cause sufficient trauma to induce their migration through the mucosa and muscularis into the serosa, ending in plastic peritonitis and periappendicular adhesions. This is especially true at certain seasons of the year, as, for instance, following the extreme heat we had during the last summer months there came a few weeks of cool, pleasant weather, which invigorated and revived the people, who had been exhausted by a long hot spell so that nearly all were again eating heartily, when suddenly the hot spell again returned, and many who had overindulged, eating to excess, especially very ripe or in some cases unripe fruit, paid the penalty, some with mild attacks of appendicitis and others with attacks so severe as to demand operation, until it seemed as though an epidemic of the disease was abroad in the land; hence eating heartily following exhaustion from any cause should be avoided.

George Crile,(24) after an experience in more than a thousand cases, says an acute abdominal pain with rise in temperature and tenderness over the seat of the appendix with its associated

referred pains, is sufficient evidence to warrant an incision, if in addition there is nausea and vomiting, rising leukocytosis, a history of previous similar attacks, and no evidence of other acute diseases, the diagnosis may be considered certain. In the case of typhlitis I have reported all of these signs and symptoms were present, yet the appendix was practically normal. On the other hand, as showing the difficulties encountered in differentiating between typhlitis and appendicitis or in certain cases of appendicitis, let me report the following cases:

CASE II.—Mr. B., aged twenty-two, taken sick for the first time in his life on August 8, 1908. I saw him two days later, when he complained of pain in the right iliac region. This pain he was positive was the first he had suffered in that region in all his life. He had also a slight rise in temperature and a marked induration at McBurney's point. I advised his removal to the hospital for immediate operation, and found a ruptured appendix discharging pus freely into the pelvic cavity, the point of perforation being just internal to a large mass of omentum fully half an inch thick, which completely surrounded the distal half of the appendix like a finger-stall. This omental covering was removed from the end of the appendix; it was opened, cleaned and dropped back into the abdominal cavity. The appendix was removed from the cecum by crushing, tying off the stump, cauterizing and covering the end with peritoneum, after which the peritoneum and abdominal wall were closed to a cigarette drain.

Note the comparison in these two cases: here is a patient positively devoid of Bennet's hyperesthesia sign, has not the cardinal symptoms as given by Murphy, neither has he Crile's certain evidence, such as nausea, vomiting, marked rising leukocytosis, a history of previous similar attacks, and he has no evidence of other diseases, yet he has a perforated, gangrenous appendix one inch in diameter, the distal end having a cavity the wall of which is composed of gangrenous peritoneum surrounded by omentum. Toward the middle of the removed organ there was another cavity almost as large, having a fecal concretion seven-eighths by one-half inch, and between these two cavities, about one-half inch wide, of almost normal tissue, containing part of the mucosa, the muscularis and serosa, in fairly good condition, but from the vessels of which there was hemorrhage discharging into both cavities.

This patient was evidently suffering from a third attack of appendicitis, yet of the first two attacks he was entirely ignorant, and the last attack gave him but few of the cardinal symptoms

of appendicitis; yet he had a suppurating appendix two days after; he, "because of slight pain," became aware of his trouble. Evidently he was almost insensible to pain and to all other symptoms of appendicitis.

On the other hand, the case of typhilitis had all the cardinal symptoms of appendicitis, with a perfectly normal appendix, showing how utterly impossible it would be to cover all cases by any rule or set of symptoms, and how difficult it is to differentiate between appendicitis and typhlitis.

Clarence A. McWilliams,(25) in the *Annals of Surgery*, 1907, says the prevailing surgical teaching that practically all acute

FIG. 2.—CASE II. *a*. Wall of appendix. *b*. Thinning of wall opposite constriction. *c*. Cavity at end of appendix. *d*. Fecal constriction.

inflammatory conditions in the right iliac fossa are appendicitis led him to make a grave error in diagnosing the condition present in a patient, and the result of his error was so fraught with disaster to his patient that he considers this question a fruitful one for investigation. His case was positively proved to have begun not in the appendix, but in the cecum as a primary typhilitis. Dr. J. B. Murphy, in his General Surgery for 1905, says the greatest difficulty is experienced in making a differential diagnosis between appendicitis and acute catarrhal conditions of the caput coli, especially if accompanied by acute retention in the cecum and associated with the intestinal type of grippe; but if symptoms were present in the order above given by him he would consider he was dealing with a case of acute appendicitis and advise operation. And in the two thousand cases consecutively reported

he had erred in two cases, which were catarrhal inflammations of the caput coli, and both these cases of typhilitis showed previous catarrhal attacks of the appendix. This would indicate that a case of typhilitis, in which the appendix had never been diseased, is of very unusual occurrence.

W. P. Plumber(26) (*Lancet*, July 20, 1907) reports the case of a miner, aged forty-eight, who strained himself while pushing a tub with his foot; at the time he felt as if "something had torn in his bowels." He did not suffer from acute pain immediately nor until several hours afterward. Seventy-two hours later, however, an operation was deemed necessary, there being great tenderness, rigidity and fulness over the right iliac fossa. He had a dry tongue, nausea, but no vomiting, with temperature of 101° and pulse of 104—symptoms characteristic of appendiceal abscess. Instead, however, there were found recent inflammatory adhesions in that neighborhood due to a tear through the serosa of the cecum, two inches away from the root of the appendix, which allowed the inner coats to bulge through. Here was a case of perityphlitis caused by a simple slip, having all the symptoms of appendicitis, without the appendix being involved in the inflammation.

In tubercular, malignant or typhoidal ulcers one expects to find infiltration, or at least evidence of infiltration of these products. In the case I have reported no such infiltration existed, but simply a large inflammatory ulcer, the origin of which is difficult to explain, only as it may have arisen from a stercoral ulcer, a catarrhal cecitis or a hematoma due to trauma; but as in analogous ulcers of the sigmoid the cause of the pathology, nor indeed the pathology itself, is not yet well understood, but such reliable authorities as Delafield and Prudden(27) say, catarrhal inflammation of the cecum is not uncommon. It is usually produced by an habitual accumulation of feces in this part of the intestines. The course of the inflammation is usually chronic, but marked by acute exacerbations. At first the mucous membrane undergoes the ordinary changes of chronic catarrhal inflammation; to this may succeed a slow suppurative inflammation which extends through the wall of the intestine and gives rise to ulcers and perforations. An exactly similar condition may rise on the opposite side at the sigmoid from which sigmoiditis and diverticulitis of the sigmoid may occur.

These observers cover my idea of the cause and pathological course of cecitis; there is unquestionably an opportunity here for

both a chemical and a mechanical irritation, mechanically causing an overdistention of the cecum wall, with points of anemia where the greatest pressure is exerted; here also abrasions of the mucous membrane may occur and infection follow, because of this organ being the receptacle of the most virulent germs of the entire intestinal tract, having also the weakest wall of the larger intestines, capillary hemorrhage, venous thrombosis and ulcerations, either superficial or deep, may follow, with possibly necrosis of the entire cecum wall, resulting in either slow or rapid perforation, from which may result either a localized abscess or a general septic peritonitis, according to location of the rupture and the rapidity of the perforating process. If slowly ruptured, protective adhesions may form; if rapid perforation takes place, local or general peritonitis may follow. This seems especially true when we consider the frequency of gastric and duodenal ulcers, due to hyperacidity of the stomach, and remember that feces in their entire course through the small intestines are alkaline, again becoming acid upon being forcibly projected into the cavity of the cecum; therefore, ulcerations of the cecum and even perityphilitic abscesses without rupture may and do occur, not because of fecal stasis, but because of mechanical irritation and chemical reaction, resulting in septic infection, in proportion to virulence of the germs then contained in the secretions.

Monroe (*Boston Medical and Surgical Journal*, 1902, 126, p. 81), from his experience in over twenty cases of lymphangitis, advises that a persistent temperature during or following appendicitis or typhlitis inconsistent with other lesions and associated with spasm in the lumbar region, would to him suggest a lymphangitis. In hepatic tenderness with irregular chills and jaundice, accompanied with emaciation, a portal pyophlebitis should be considered, especially if these symptoms were either preceded or accompanied by an attack of appendicitis.

In discussing Wm. Fuller's (28) unique case of twisted omentum, D. A. K. Steele reported a case of enlarged convoluted and twisted omentum, which he sent to the hospital for operation because of a supposed recurrent attack of appendicitis, but in which the real pathology was found to be in a twisted omentum.

In actinomycosis the pains may or may not be referred to the right iliac fossa; if so, they are vague, and not so pronounced as in other acute, subacute or even chronic inflammations in this region. Even if the pain should be severe in the first stage of this disease, there are no local signs, but in the second stage,

when a tumor forms, the abscess is more spongy, the skin is shiny, thickened, edematous and of a purplish-violet color. Children under fourteen years do not suffer from this disease, and if in doubt in older people, the actual confirmation of the disease would depend upon finding the ray fungus. Gall-bladder trouble, salpingitis, pyosalpinx and many other abdominal troubles, as well as obscure cases, such as coxalgia, sciatica, etc., have been diagnosed by mistake when the inflammation was found upon operation to be in the cecum or appendix. It is well to remember another suggestion of Sir Wm. H. Bennett,(29) viz., that it cannot be too distinctly understood in cases of acute inflammations of the right iliac fossa that a very rapid or sudden disappearance of any one prominent symptom, *e.g.*, pain or high fever, without a corresponding change in all other symptoms is, as a rule, a sign of danger, and not of improvement.

Treatment of the conditions in this region depends entirely upon what conditions are present. Experienced operators are getting good results under the most trying circumstances and complications.

SUMMARY.

1. I affirm that typhlitis and perityphlitis can take place independently of appendicitis.

2. That appendicitis can and does occasionally occur secondary to or may follow these diseases.

3. To have appendicitis it is not necessary that the mucosa of the appendix be the seat of primary inflammation.

4. A catarrhal inflammation of the cecal mucosa may precede and be the cause of a similar condition in the appendix from which may follow periappendicular disturbances.

5. From the multiplicity of opinions found in medical literature, it is evident this question is as yet unsettled.

6. It is possible that there are twice as many retrocecal peritoneal adhesions as there are periappendicular peritoneal adhesions, as proven by observation, autopsies and surgical operations.

7. Modern pathologists are inclined to the belief that the cecum is quite frequently and primarily involved.

8. Appendicitis may result from primary typhlitis.

9. In cases of cecitis the appendix is not always the root of the evil. (Tyson.)

10. Stercoral ulcer has a definite position in the production of perityphlitis. (Treves.)

11. The appendix is frequently infected from a diseased cecum

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DISCUSSION.

DR. ROBERT T. MORRIS, New York.—I rise to agree with every one of the points made by Dr. Lyons, but I want to impress one point in particular which he left out, that is, that the difference between cecitis and a destructive appendicitis is a mechanical one. The tissues in the cecum and in the appendix do not swell equally, for the reason that the tissues in the appendix are in a tight sheath. Compression anemia follows swelling, the

bacteria attack that point, and then follow a perforation and explosion. That is the history of appendicitis. That is the difference between cecitis and appendicitis, and the whole history lies in that mechanically tight constriction of the appendix, no matter why the tissues swell.

I have had two cases of typhlitis or perityphlitis (perforative), one acute and one chronic. In the acute case perforation occurred at a point about two inches from the appendix. The patient had peritonitis when I saw him. The case was diagnosticated as appendicitis by the family physician. The appendix was not involved, excepting there was a moderate degree of interstitial serous exudation. It was not red; it was not distinctly involved; but the cecum was perforated. He had peritonitis, from which he recovered.

The other case was one in which perforation had occurred some months previously. The patient recovered under medical treatment, as these patients do sometimes, even with pus in the peritoneal cavity. He had so many adhesions that I operated for separation of them. A diagnosis of appendicitis was made at the time of the acute attack. In separating the adhesions I found the site of perforation about four inches from the appendix; but the circular perforation had left its distinct scar, and well-formed white adhesions at this point left no doubt as to the character of the original attack.

With reference to cecal adhesions, Byron Robinson has given us an explanation of the reason why there are more adhesions about the cecum and sigmoid than elsewhere. He says it is because of the thrust of the psoas muscle. That explanation is a good one, and Robinson has worked it out pretty well.

Dr. Lyons (closing the discussion).—I wish to say, in reference to the remarks made by Dr. Morris, that I mentioned the psoas muscle thrust of Byron Robinson as being a cause in nearly all cases of cecitis; but cases of appendicitis also are due to injuries caused by the normal action of the psoas muscle; hence walking, coughing, jumping and the like to excess, are liable under certain conditions to cause appendicitis and typhlitis.

SOME OLD FALLACIES IN RETROVERSION SURGERY REVIVED.

BY

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THE last decade of the nineteenth century was a memorable period in gynecology for the large amount of rather riskful and experimental surgery for retroversion and retroversioflexion of the uterus. Ventrofixation, ventrosuspension, vesico- and vaginofixation, and notably the intraabdominal shortening of the round ligaments by the Mann and other forms of doubling them upon themselves, were all extensively tried and mostly discarded, either because some of them caused serious and unexpected obstructions to child-birth and numerous deaths from that cause, or because the uterine displacement recurred altogether too frequently, both before and particularly after intercurrent pregnancy and labor. The principal structure that was made use of as a means to an end in the surgical reconstruction, was the peritoneum. Its capacity for two continuously and firmly approximate surfaces to unite and its thinness and loose attachments which enable it to pull out and stretch to form bands, soon brought the peritoneum into this service. But it was soon discovered (what the writer called attention to eight years ago), that such supposedly sero-serous unions often became fibro-fibrous junctures or bands, because of the round cell infiltrations and connective-tissue formation which follow slight infections at the time of operating; so that serious barriers to parturition arose, sometimes after careful and considerate operating.

Again, owing to the variable and unknown degree of interference with the blood-supply of the parts by the sutures which hold them temporarily together, no operator can certainly determine by any suture material and sutures most carefully chosen and placed, how extensive a union or how strong a band he will develop nor how long it will hold. And, furthermore, what deals a death-blow to the peritoneum and all its foldings, plications and attachments, for the cure of uterine displacements permanently, is the fact that pregnancy during its long period

of gestation practically wipes out all these folds, plications and fixations, if they are really harmless and do not trespass upon its right-of-way, and the good of such surgery ends with the next following parturition. Accordingly, the evanescent nature of the cure of the displacement on the one hand, that resulted when a technic of operating upon these peritoneal structures was chosen, that would probably not cause obstructions to subsequent child-bearing and labor, and the numerous parturient disasters on the other hand, that followed when the surgical procedures upon the same structures aimed at greater certainty and permanence of the anatomical result, caused most careful workers in this field to look for some more harmless, effective and certain structures than the peritoneal parts, to utilize surgically for the cure of this common disorder. This they found in the round ligaments of the uterus. These structures being composed mostly of nonstriated muscular fiber, derived from the uterine walls, and bloodvessels, are a part of the uterus itself; and, as such, undergo with it its physiological metamorphoses incident to child-bearing—namely, evolution during gestation, and involution after labor.

Some years ago two Germans almost at the same time and independently made the discovery (pertinent to Cesarean sections), that the round ligaments grow evidently in every pregnancy, and can be felt at term when the abdominal wall is not too much loaded with fat and its muscles are relaxed, as structures approaching the size of a finger; and that from their upward course, whether more parallel or diverging from each other, it is possible to infer whether the placenta, in a mature case, is probably attached to the anterior or to the posterior side of the uterus respectively. The anatomical nature and physiologic capacity of these ligaments make them a really live and rather intelligent medium for the purposes here aimed at; in comparison with which all peritoneal attachments, plications and bands (so-called artificial ligaments) are dead things deserving recognition in the domain of pathology only, as kindred of other bands and adhesions produced by disease and not willfully by misguided surgeons. The unique and crowning feature of great value in the round ligaments is their capacity or nature to undergo involution with the uterus after labor. This supplies really the only possibility for a permanent cure of retroversion—one that will endure beyond subsequent child-birth, for all fixations and bands of a peritoneal or other source have no capacity to retract after labor.

What I have so far stated is rather generally known and accepted by most careful and intelligent men who have had any considerable experience in this direction. To them the round ligaments are the preferrable medium of choice in dealing with these displacements, and the more recent question of how to use them has also been decided in favor of (firstly) some one of the numerous variety of transplantation of the round ligaments into the abdominal wall, when median ventral section is made, and (secondly) shortening of them via the inguinal canals, when complications are absent in the case and no other intraabdominal work is needed. So satisfactory are the results of these methods, in both of which the thick end of each ligament is brought into the principal service, that they will remain no doubt as standard. "The persistent backache" that Dr. Coffey charges these operations with, he alone seem to have found following them. Nevertheless, an elaborate article was presented before the Chicago Surgical Society some six months ago and later appeared in "Surgery, Gynecology and Obstetrics," entitled, "The Principles on which the Success of Surgical Treatment of Retrodisplacements of the Uterus Depends," by R. C. Coffey of Portland, Oregon.

The author's principal theme is, that the peritoneum is the chief and all-important structure from which the supports or ligaments are derived that hold the stomach, liver, intestines, spleen, and all the female generative organs in their places. By numerous good illustrations, he traces the embryological development of these supports, by uniting where they double upon themselves, while the endothelium is absorbed, *pari passu*, with the growth of the intestinal tube and the formation of its convolutions. The author concludes that because each viscus has a peritoneal mesentery that is capable of holding many times more than the weight of its respective organ without tearing; therefore, the mesentery is the chief support of each organ, including the uterus. This conclusion is doubtful because the numerous cases of enteroptosis and the like, in persons with relaxed and defective abdominal walls, indicate that the retentive function of the abdominal wall is probably of equal, if not of greater importance in preventing undue elongations of the various mesenteries.

Next, Dr. Coffey states that he has by numerous animal experiments confirmed (what we have usually believed) that when two peritoneal surfaces are held continuously and firmly together as by interrupted sutures, they will unite and form one layer with obliteration of the intervening endothelium, this scarcely anyone

will deny. But when he declares that the broad ligaments of the uterus, as a mesometrium, and especially their anterior blades, are the most important and natural thing to hold the uterus in its anteverted position, and that shortening of these blades by plication is the most rational and effective surgical method of cure for a retroversion, then we must protest that he is drawing an unwarranted conclusion from experiments upon the peritoneum of abdominal organs, none of which have similar functions nor undergo such changes as does the uterus. Furthermore, all good effects of his plication operation, upon the front blade of the broad ligament, will terminate when the next baby comes. There will be nothing left to prevent a return of displacement, if any tendency toward it should again rise, because a normal gestation eliminates such sero-serous unions that impede its way, by stretching, or otherwise, and being devoid of muscle or other elastic fiber, they certainly have no capacity to retract or recoup themselves afterward, any more than if no such operation had previously been performed on them.

Dr. Coffey omits child-bearing, the live part of this entire subject, from real consideration. He alludes to it in a casual way at the close when he says: "I have learned of a number of patients bearing children since operation. All were uncomplicated and, as far as I can learn, the uterus remained in position after labor," and he further adds that this is an important feature. But right here comes in the clincher in the whole matter, that vital evidence which decides the stand or the fall of any operation for retroversion of the uterus; and such evidence cannot be taken in random reports, guesswork, hearsay, or patients' opinions, nor can it be deduced from their subjective condition. Only actual, careful bimanual examination by the operator himself, or trained assistants, in each one of a large number of cases that have born children after operation, can be accepted as competent evidence upon this vital point, namely, whether any given operation is not merely innocent of harm, to parturition—*the simple test of pregnancy*—but whether it is also really curative by securing the uterus in normal position quite uniformly in a larger number of such cases, *after* one or more labors—*the double test of pregnancy*. No operation for retroversion of the uterus, no matter how pretentious be its doubt, can be accepted as a normal or standard procedure until it has passed this double test. Child-bearing is the crucial testing feature that supplies about all the interest, importance and dignity that there is in the consideration of the surgical

cure of uterine displacements; for in women who cannot conceive this disorder is of minor importance and it can be successfully treated in so many surgical ways that it is no longer a dignified fsubject ousr discsion. And, no more worthy or called for are articles on this subject, no matter how florid, that do not apply the above-mentioned double test of pregnancy as the chief measure of their value.

It is high time that promoters of preferred operations in this line do less talking and writing and more real work in finding and examining their patients after they have born children, and then reporting the findings without bias—a duty which so far, in our country, hardly any others than the Alexander operators have done. Dr. Coffey, in trying to carry out his primary idea of the importance of peritoneal derivatives as the chief supports of all abdominal and pelvic viscera, ascribes to the broad ligaments of the uterus the rôle of chief supports both in an upward and forward direction. He thinks that the anterior blade of these ligaments must hold the uterus in anteversion, that when it becomes relaxed the uterus falling backward as a dead weight upon the round ligaments tires these out and retroversion and descensus follows. He thinks that the most normal method of cure consists, therefore, in shortening the front blade of the broad ligaments by plication. This will no doubt suffice until the next child-birth, when gestation will have eliminated the operative shortening; whereas, if an efficient shortening of the round ligaments had been made—such as now is generally practised—these would have kept pace with the rest of the uterus in its metamorphoses, and would therefore continue afterward to poise the organ with a forward inclination.

Dr. Coffey admits that there are round ligaments, although objecting to the name ligament. He admits that they are composed, in the main, of uterine muscular fibers, are placed where such structures are needed and that they must not be permanently crippled, as they certainly have some material periodical function in guiding the body of the uterus forward, when overfilling of the bladder, or rectum, or dorsal recumbency would tend to throw it backward. This is about all that is usually claimed for them by any one. Nevertheless, Dr. Coffey says he thinks these structures have been "a stumbling block to many of our gynecologists." Equally inconsistent and without proof are his statements that the round ligaments need but to be relieved of tension, and they will then shorten or recover themselves; and second, that they

work independently of the peritoneum, that when they are folded up by sutures, along with their enveloping peritoneum, they will pull out of their entanglement in the course of four or more months, when the sutures are absorbed, and leave the folded peritoneum united in the position first secured by the sutures.

Against the first of these assertions there arises a small army of women, to which I could contribute a small regiment, who have had their uteri held in anteversion, and the round ligaments slackened continuously by pessaries for years with revision by a doctor, at stated intervals each year, and a cure of displacement in only about one or two per cent. of all such cases resulted. The muscular round ligament bands, composed of nonstriated, involuntary muscle, for some reason do not retract when relieved of tension, as we see striated and voluntary muscle does, in orthopedic surgery. They can be depended upon to do this, only when involution is upon them and the uterus during the first months after labor. As to the other assertion, I would entertain much doubt, unless pregnancy and labor intervene. In three cases, years ago, where practically the same procedure upon the parts was done for retroversion, that Dr. Coffey advocates, and next a child was born, and then another operation for retroversion followed; every trace of the former operation had disappeared with the return of displacement after the labor.

Dr. Coffey says the round ligaments cannot endure constant tension. It remains for him to prove first that this is asked of them, naturally or artificially. Naturally, it is probable that they merely need to guide the fundus uteri forward, when it has been temporarily turned over backward, during dorsal recumbency, or by overfilling of the bladder and rectum. At other times intraabdominal pressure and gravity probably hold it in a forward inclination, especially during the erect posture, while the ligaments are idle. But if there be doubt in regard to this, doubt no longer exists as to the availability, efficiency, and transcending value, of these structures, as a means in the surgeon's hands, to cure the most prevalent infirmity among women, and to do it harmlessly and permanently. Three years ago, in my last report of the remote results of fifty cases of my bi-inguinal (extended Alexander) operation, I made a collection of one hundred and sixty-eight cases, each of which had been examined, late enough after a child-birth that had followed an Alexander operation, in the hands of some one of twenty odd operators. In this list of 168 cases (*Jour. Amer. Med. Assn.*,

Nov. 18, 1905), there were only three recurrences of retroversion; and these were for cause—namely, cases of prolapsus that should not be treated by that method. In view of this mountain of most positive evidence in favor of the surgical value of the round ligaments, and of one of the accepted standard methods of using them, it behooves Dr. Coffey and all other promoters of diverse views and methods to spend enough time and money, as others have done, to find and to examine every one of their cases, as far as is at all possible, especially those who have born children since operation, and then to report the findings in an unbiased, scientific manner, as evidence before the court of science. If they will each produce but a fraction of such a number of "double test" cases, as the above mentioned number with a similar small rate of failures, we will give them a respectful hearing; but mere theories and vagaries are as "sounding brass and tinkling cymbals," and will not pass as evidence.

Finally, Dr. Coffey proposes to practise what, from his statement of the subject would impress any physician who is not familiar with the subject, as a new operation. But it is the identical bi-inguinal laparotomy or laparotomy by the Alexander route that I devised in 1893, and have performed over two hundred times, three times in Germany; that I have written about seven times; have reported the ultimate results of four times before national and international meetings, and still regard as the most nearly ideal operation for retroversion in fruitful women. But, since transplantation of round ligaments into the abdominal wall, via a median ventral incision, has been found to produce nearly as good results in curing the uterine displacement, and the median incision offered the great advantage of access to the vermiform appendix, and makes an exploration, at least, possible for all other vulnerable points in the abdomen, this method has nearly superseded the bi-inguinal route in my practice. Yet that ship which I have built Dr. Coffey proposes to appropriate and to sail in under his own colors. He has performed that operation only four times, as a convenient combination, in cases that had an inguinal hernia to be treated by the same incision. He likes it, as I do, and have done the same thing many times, with the best of results, and have reported such cases. But the morbid bias of Dr. Coffey in favor of his peritoneal theory appears when he ascribes the good results of all successful Alexander operations, to an imagined shortening of the anterior blade of the broad ligament,

incident to the traction upon the round ligaments, rather than to the shortening and anchoring, in a more forward direction, of the round ligaments themselves.

To be mentioned, to be discarded, is another futile procedure advocated by Dr. E. H. Ochsner, before the Chicago Medical Society, on April 15, 1908, with the following title: "The Temporary Suspension of the Uterus. The Technic, Indications and Results." Ochsner advocates an Olshausen sero-serous fixation of the cornua, of the fundus uteri, with the parietal peritoneum at each side of the median incision, the idea being to hold the fundus forward, for a brief period, during which time the round ligaments are supposed to retract, and to serve in place of the defunct fixation. That this is an unwarranted deduction from orthopedic surgery I have already stated; and as he proposes this light fixation largely in cases where pus tubes and neoplasms have been removed and extensive raw surfaces exist, where infiltrations of the broad ligaments remain and pregnancy is out of the question, it is often impossible for the surgeon to separate the round ligaments and more so for nature itself. Durable, fibro-fibrous ventral fixations are there in order.

The conclusion of this whole matter is that we have learned nothing new, from these gentlemen, about the cure of retroversion of the uterus; that we have sat in judgment upon practically the same propositions many years ago, have weighed them well in the scales of experience, and found them seriously wanting.

REPAIR RATHER THAN REMOVAL OF THE GENERATIVE ORGANS OF WOMEN.

BY

JOHN EGERTON CANNADAY, M. D.,

Charleston, W. Va.

It has been well agreed that nature should have the first chance at many if not most cases of salpingitis, and in event of her failure the surgeon be called on to remove or correct, as far as possible, the offending pathology. In these cases the surgeon has either of the two or a combination of both conditions to treat: infection or the results of infection; the one he will treat by removal or by drainage—neither being ideal by any means. The other he can hope to correct and repair by plastic measures.

It has seemed practicable to me to divide cases of gonorrheal pelvic infection into two classes, dependent somewhat on the social condition of the woman. The woman who can afford the time and money to lie abed for several weeks and to be a sort of semi-invalid for some time, afterward should have palliative measures and in a large percentage of cases will recover by virtue of her own powers of resistance and repair. If these fail she becomes a good subject for operation later and the results will be generally excellent.

If, on the other hand, the patient is poor and must get well and back to her work as soon as possible the case is not one for temporizing measures, and a prompt operation gives her a virtual assurance of being able to resume her work as a bread winner at an early day. She cannot afford to take so many chances of prolonged semi-invalidism and a late recovery, together with the added expense of treatment and the surroundings that would be necessary to make her life tolerable.

As soon as physiological resistance to infection has been well established, complete removal of the infected tubes brings speedy results. The nonoperative treatment of these cases, many statements to the contrary, notwithstanding, is in the main, judicious neglect. The numerous hot douches, tampons and other applications to the cervix and vaginal vault have as their real purpose the diversion of the patient.

At times the removal of an infected ovary will be necessary but, as a rule, resection at most for cystic disease will be all that is indicated. Retroverted, slightly prolapsed, congested, subinvoluted uteri with their appendages, will after suspension, perineorrhaphy and rest usually approach their normal state. Chronic endocervicitis and endometritis can usually be cured by local applications to the interior associated with other corrective measures and do not as many would have us believe call for hysterectomy, an operation the results of which make more nervous our already neurotic women.

In the chronic catarrhal inflammatory conditions of the cervix we have as causative factors congestion from impaired circulation due to prolapse, to tumors, malpositions and other physical causes. Then added to this we often have a very old, very chronic infection. The physical causes must be corrected by suitable surgery and then the local infection can be attacked by the local application, the cautery and the curet. Erosions due to cervical tears allowing the cervical mucosa to become everted may call for plastic procedures.

The presence of a few small fibroids in or on the uterus of a child-bearing woman are often best treated by myomectomy. The uterus can be easily explored by an anteroposterior incision bisecting this organ when submucous fibroids are suspected and their removal be easily accomplished. In dealing with cases of complete prolapse of the uterus there are several surgical measures which surpass in their effectiveness those operations of which hysterectomy is the principal part. Naturally, malignancy and tuberculosis call for removal of the completest sort.

DISCUSSION ON THE PAPERS OF DRS. GOLDSPOHN AND CANNADAY.

Dr. Herman E. Hayd, Buffalo.—I wish to thank Dr. Goldspohn for presenting such a splendid paper on this subject; and I agree with him in every respect with regard to the drastic criticism he has made of the Coffey operation.

Dr. Goldspohn and I have written so many papers on the subject of round ligament surgery, that I congratulate him to-day in saying that if we want to open the abdomen, the best way to do it is through the median line, and not by the inguinal method, since we have the operation of Gilliam that is satisfactory if the abdominal cavity has to be opened. There is no use in talking about the question of the Alexander operation, because we stand in the same position that we have heretofore, namely, where we have an uncomplicated retroverted uterus,

the Alexander operation can be performed, which will stand the crucial test of pregnancy. That I answered in a challenge to Dr. Goldspohn some two or three years ago by reporting a great number of women that I myself confined, or my professional friends had attended in labor and whom I subsequently examined.

Dr. Robert T. Morris, New York.—In connection with Dr. Cannaday's paper, I wish to say that we ought to do conservative surgery in the pelvis, saving everything we can, and that we should bring the patient into our confidence and be guided by her wishes. That is very essential. For instance, in a case of fibroid tumor I say to a woman, I will shell out this big fibroid or myoma and leave most of the uterus so that you may have children, but you may have neoplasms again, because of the fact that the kind of uterus is left from which the fibroid originally developed. What do you want? Shall I take out the whole uterus or shall I save it in order that you may possibly bear a child but with the risk of later degeneration? One woman may say that a million dollars depends upon having a child; while another will say, take out the whole thing; I am forty-five years of age and do not want more children. So we must be guided by the expressed wishes of these patients.

Dr. Thomas B. Noble, Indianapolis.—From what we have heard in these papers and discussions, it is clearly evident that on account of the multiplicity of operations for retrodeviation or retroversion of the uterus, probably not one of them is always satisfactory. We have seen most of the operations devised fail, and we have seen successes attend almost all of the plans that have been pursued. In contemplating the correction of a retroverted uterus by operation, I believe we have to consider infinitely more than that. Many of these cases are attended by a general visceroptosis; they are attended by a great lengthening of the uterosacral ligaments, by ruptures of the perineal floor, so that we find from the diaphragm to the perineum we have all the supportive elements removed, and the symptom-complex in our cases cannot be attacked by a procedure directed to the round ligaments, the broad ligaments, ventrosuspension or ventrofixation, or any one particular method. This is one of the pathologic complexities that cause me more concern than any of the plastic work I am called upon to do, and just for the reasons I have given. I believe that in our reparative and plastic work we lose sight of the etiologic factors. To me the uterosacral ligaments are the ones that have been slighted in the years gone by, and primarily by two particular faults: one of them in the unmarried woman from long-continued constipation and in the erect position. I observe this most commonly in girls behind the counter who pay little or no attention to bowel activity. A heavy sigmoid will stretch the uterosacral ligaments, and here we find a great support to the uterus. They are the prime foundation. The position of the uterus depends

on the uterosacral ligaments, and not on the round ligaments, not the broad ligaments. Again, we find this following faulty childbirth, and I would recall here as a means of cure the prophylactic measures suggested by our President, in which he spoke of the better care and better knowledge of our parturient women. We will get a cure for these cases by prevention. They follow often abortions that are badly managed, and so the whole trouble comes from insult directed upon the uterosacral ligaments. I believe, therefore, that the solution of this condition relative to the uterus itself must come from our direction to and thought upon the uterosacral ligaments as the primary supports of this important viscus.

Dr. Goldspohn (closing the discussion).—From the remarks that have been made, I would like to have some time to talk about the anatomy and physiology of the female pelvis; but that is utterly impossible at this moment.

One speaker (Dr. Noble) said the uterosacral ligaments are the supports, and not the broad or round ligaments. The broad ligaments are emphatically the supports that hold the uterus in the pelvis, so far as perpendicular direction is concerned, to keep it from coming out. The uterus is not retained by the perineum. The uterus properly does not lodge and rest upon the perineum, except during straining efforts, at defecation, and the like. The very best perineum may exist, and yet retroversion of the uterus occur, and one may have a very pronounced laceration of the perineum with the uterus in its normal position.

The uterus is suspended in the body like a baby in a jumper that does not quite reach the floor. The jumpers are the broad ligaments. There are two sets of ligaments that secure the normal forward inclination of the long diameter of the uterus. The sacrouterine ligament, being a slight peritoneal fold with very little or no muscular structure in it, is attached to the lower pole and holds it back, while the upper pole of the organ is held forward chiefly by the round ligaments. But the main structures are the broad ligaments, so far as retaining the organ in the body is concerned.

As to the care of parturient women, if all men who delivered women were expert bimanual examiners and gynecologists, then we could gradually have a great reduction in the army of retroversion cases. The round ligaments will shorten if given slack or rest continuously early enough when involution is still upon the uterus and these ligaments after a labor. This can be done by the patients' assuming the genupectoral position several times daily to assist the action of a pessary, which must be adjusted by a bimanual expert quite frequently at first. If this is successfully carried on, at the end of about a year the pessary can be removed and, as a rule, the retroversion will be cured; but if you imagine the round ligaments are going to be shortened, after involution is no longer to be expected, you are waiting for a futile cause.

I hold just as highly to the Alexander route as I ever did, as none of the other operations for retroversion have ever produced as convincing results as the Alexander alone has produced; but it behooves us not simply to cure the retroversion, but, as Dr. Noble has pointed out, to attend to other things, notably the vermiform appendix. Very often we need to palpate the pylorus, the gall-bladder, or the bile ducts. Often we have a relaxed linea alba in a woman who has born many children and has a deficient abdominal wall, and therefore has the beginning of enteroptosis if she does not have it already. We want to do away with that weakness by bringing the abdominal recti together. So there are many things we need to do for these women besides our duty toward them in attending to the conditions in the pelvis, and that we can do through a median abdominal incision. If the Alexander incision were capable of this, I should still continue to employ it for most of the cases of retroversion.

EXPERIMENTS ON ANIMALS RELATIVE TO THE QUESTION OF ABDOMINAL SUPPORTERS AFTER LAPAROTOMY.

BY

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New York.

For a good many years I have made it a rule not to apply an abdominal supporter after abdominal operations, relying mainly on methods of suturing. Now and then a patient will come into my office wearing an abdominal supporter asking me if she cannot take it off. In reply I ask the patient who put it on, and generally the answer is that her doctor or nurse, or some friend recommended it. Friends are apt to interview patients after operations and induce them to invest money in abdominal supporters. These supporters are, for the most part, abominable, and are of no earthly use. Abdominal supporters, as I see them, are not doing any good whatsoever. The *vis a tergo* of a progressive hernia is not restrained or relieved by an abdominal supporter, and it has been my rule not to apply them at all.

In repairing the abdominal wall, I have made it a rule not to employ any fanciful methods of closure, but simply try to leave things as I found them. If the different layers of tissue are brought together properly, healing will take place. It is very essential to get the muscle margins and the skin margins together; in other words, to leave things as they were found.

In making a number of experimental tests upon animals to determine the length of time required for repair, I was interested in the results. For example, I experimented with a series of rabbits, the rabbits being put in the horizontal position. Eight or ten rabbits were operated on. At the end of three days we, I and my assistant, cut out a strip of tissue three inches long and half an inch wide, one including the line of incision through the abdominal wall. Another similar strip was cut out, but we had to leave part of the abdominal wall undisturbed, fastening one end of the strip with a pair of clamps, and the other being pulled on with forceps. The first rabbit was killed

within three days. The strip of tissue that was normal, not including the incision, gave this result: the skin tore apart at eighteen pounds pull; the muscle and fascia pulled apart at sixteen pounds pull; the peritoneum gave way at seven pounds pull. The sutured area in this rabbit, killed three days after operation, did not give resistance sufficient to stand one pound pull on any structure. Another rabbit, killed seven days after operation, gave this result: normal skin pulled apart at seventeen pounds pull; skin pulled apart at two pounds; normal muscle and fascia pulled apart at fourteen pounds; sutured muscle and fascia pulled apart at five pounds; normal peritoneum pulled apart at eight pounds; sutured peritoneum pulled apart at eight pounds.

This is interesting as showing the relative degree of repair observed in this series as well as in a number of other animals. The peritoneum was practically entirely repaired at the end of seven days, while the other structures underwent repair less slowly, and the skin last of all as shown in my experiments.

Another rabbit, killed ten days after operation, showed that repair was perfect practically in all structures, but the muscle tear extended into the stitch holes, or the tear extended into normal tissue alongside. The tissue gave way at the skin wound line only at the end of ten days. In a rabbit, killed fourteen days after operation, as I pulled one could see the fibers slit, and not one of the structures gave way at the wound line at the end of fourteen days, excepting as it took with it a part of the normal structures. In the skin one could see the different fibers stretching during the pull. One could observe the fibers of the muscle and fascia slitting as in a textile fabric. The peritoneum of the rabbit is adherent, but you can pinch it up with your fingers. At the end of fourteen days all structures were repaired in the rabbits. Rabbits killed eighteen, ten, twenty-one and thirteen days after operation, all gave similar results.

The important point I wish to make is this: most of the abdominal supporters applied after operation are applied unnecessarily, and practitioners do not have in mind the proper idea of the mechanics involved, even though patients are in a perpendicular position most of the day instead of the horizontal posture.

There is one special point I wish to make and that is this: in suturing the layer of skin or fascia, I am very careful not to allow any suture to get into the layer of fat, because it will allow

some particles of fat to go through, and if any should go through it is bad for us. The suture goes through skin only. If the patient has a layer of fat four inches thick, not a particle of that suture is allowed to go into any part of that fat, and I am very, very careful not to allow the needle-point to go into that fat. No fat is lost. By suturing skin only and muscle layer beneath, leaving the fat entirely without suture, we get the effect of atmospheric pressure. This atmospheric pressure, from a mechanical standpoint, is of vast importance, and, it seems to me, we should strive to restore the abdominal incision in such a manner as to do away with these pink ornaments, these elastic abdominal supporters, which are odoriferous, as well as useless.

DISCUSSION.

Dr. Walter B. Chase, Brooklyn.—I would like to ask Dr. Morris what inference he would draw from these experiments as to the time a human being should get up after an operation?

Dr. John D. S. Davis.—I would like to ask Dr. Morris whether he imbricates the fascia lata?

Dr. John E. Cannaday, Charleston.—I think we all agree that the time for the prevention of postoperative hernia is at the time of operation, by getting proper closure of the wound; hence I do not believe that the wearing of bandages and supporters can have any possible bearing on the case. If we avoid dissection of trophic nerves, make short incisions, and with our muscles effect good approximation, we won't have hernia. I never advise the wearing of a support of any kind, and I have had less than one-tenth of 1 per cent. of postoperative hernia in undrained cases.

Dr. Miles F. Porter, Fort Wayne.—As a general proposition, I quite agree with what Dr. Morris and others have said; but I rise to protest against the statement of the last speaker (Dr. Cannaday), that absolutely nothing, except suturing of a wound, has anything to do with the development or lack of development of a postoperative hernia. Other things have very much to do with the result, it matters not who sutures the wound or how he does it. If you bring pressure to bear on the wounded surface not only before these parts have closed, but before they have been reinstated to the mature condition that obtained prior to the operation, there is great chance of having a hernia. And that brings me to another point, and that is, it occurs to me, the lack of support, the time which it should be applied, or whether it should be applied at all, depends very largely upon the way the incision is made. For example, McBurney's incision never needs any support because of the mechanical principles that obtain in the muscle separation.

On the other hand, I asseverate that an incision in the semilunar line does need support, and if you do not give support there until the strong connective tissue has been restored, you are likely to have a hernia. These herniæ do not develop always in two or three years or four years, but later on. The point is this: it is just as illogical, just as unsurgical to say that some of these tissues under certain circumstances cannot be supported with bandage with advantage as it is to say a fracture does not need to be supported. As a general proposition, I concur in everything that Dr. Morris has said, but the notion that no support is ever needed in these cases is wrong. And so it is with regard to the time that these patients get up after operations. That, again, depends upon where the incision is made and the method of making it very largely. It takes almost as long for the connective tissue forming the sheath of the rectus muscle to become mature as it does for bone after it is broken, and everyone experienced in orthopedic surgery knows what you can do with bone three weeks or even four weeks after fracture by continuous pressure, and if we can avoid continuous pressure by proper adjustment of support, in addition to our sutures, then we are doing a logical thing when we use this support.

Dr. Albert Goldspohn, Chicago.—I do not believe abdominal supports have much to do with the prevention of hernia following operations for the reasons given by Dr. Morris. The all-important things are to make the incision not too far away from the median line so that the nerve supply will not be interfered with, and then get union of all the chief or important structures individually by suturing in layers, being particularly careful to coapt the aponeurosis in front of the recti.

Dr. Morris (closing the discussion).—Dr. Chase has asked me whether I keep patients in bed longer than some operators do, based upon the experiments I have conducted and cited. In answer to that, I will say, for instance, that I keep some patients in bed for seventeen days; sometimes for twenty-one days. After a McBurney short incision in an appendix case, where I split the soft structures and cut nothing else, the patient is allowed to get out of bed at the end of six or seven days and to go home in ten days. If an incision three inches long is made in the semilunaris, I keep the patient in bed three weeks, but would allow that patient to go without any supporter except for a few days while she is walking about, simply a rubber plaster supporter until the patient feels comfortable without it. In my remarks I had in mind doing away with those elaborate supporters that are worn for months and years after operations. I probably apply a supporter in 1 per cent. of cases where I leave the wound open for drainage. Where there is a weak point, if there is any doubt about it, I put on one of these supporters, but that does not occur in more than 1 per cent. of the cases, and perhaps not that.

As Dr. Porter has pointed out, if we make pressure too early

after proper repair, we are likely to have hernia, Most of the abdominal supporters that are used by my patients after operations have been suggested by friends or other physicians or by corset makers, and they are generally worthless and useless and should not be applied. I have no intention of applying them, and they are put on by others with the idea of supporting the structures to prevent the development of hernia, but for that purpose they are generally worthless. Some of my patients may have hernia after I operate on them, but they may go to somebody else, so I do not know. Of those that come back to me the percentage of hernia is very small, a fraction of 1 per cent. Of course, I don't know how many cases go to others; I can only report what I know about.

In reply to Dr. Davis, I do not imbricate the fascia. I use a running suture with which to bring the posterior sheath together, and another running suture to bring the anterior sheath together. Just a smooth, even approximation of all structures is what I strive to get, leaving them just as I found them in nature.

FIBROID TUMORS COMPLICATING PREGNANCY.

A SHORT HISTORY AND REPORT OF ALL RECORDED CASES TO JANUARY 1, 1908.

BY

J. H. CARSTENS, M. D.,

Detroit.

LOOKING over the reports of the cases of fibroid tumors complicating pregnancy, I notice that nearly all were subject to abdominal section. Only a few, especially of the older cases, reported obstruction during labor, and these were not subject to operation. Sometimes hemorrhages or difficulties in removing the placenta were recorded; sometimes also mention is made that the tumor or tumors were removed at the time of birth or shortly afterward per vagina; in some cases virtually nothing is stated about the final outcome and results. Of these cases there are 18 also put on record, but I have not tabulated them.

Some of the reports are very imperfect, in not stating definitely the exact operation performed nor the result, and in others the age of the patient is not given nor the number of children she had had previously. It was quite a difficult task to put them under the correct heading. A few had to be left out altogether for this reason, but every single case is mentioned in the alphabetic list.

I have had the most thorough search made for every case to its original publication. I do not believe any case ever published has been overlooked, though it is possible that a few cases have escaped, but I am sure that this list of all cases ever published is as accurate as it is possible to get. It is remarkable how the last ten or fifteen years have increased the number of the reported cases and the large number some men have been able to see.

What interests us especially are the surgical cases, that is, those subjected to

ABDOMINAL SECTION.

The tabulated number of cases in my report is 516 and of these 498 were subjected to various abdominal operations. Of these there were 117

AT FULL TERM.

(or nearly so). Of this number eighteen died.

The number of living children of this class was eighty-nine. The number of children that died or that were dead at the time of the operation was eleven and in seventeen cases the result to children was not stated.

Forty of these cases were subjected to Cesarean section, and of these five died. Nearly all these cases had myomectomy also done, but the uterus was preserved by doing a classical Cesarean section. All the other cases were subjected to a Porro operation; that is, the uterus was opened, the child extracted, and than the uterus removed.

LESS THAN SEVEN MONTHS.

I had some trouble in deciding how I should classify the other cases according to the months they were pregnant—before three months or before four and one-half months and those after this time.

In order not to make this paper too long, and as I could see no use in having this fine classification, it seemed to make no difference whether the patient was two, four or six months pregnant; I finally decided the best way would be to group them all under one head and tabulate those cases where the child was not viable, and so list all the rest of the cases at less than seven months.

Of this number 381 were subject to various kinds of operation. Of these 355 recovered and twenty-six died. One hundred and fifty were subjected to myomectomy with thirteen deaths; twenty-two aborted after the operation, but recovered all except three. The rest recovered and eighty-six of these were delivered at full term, one of which died as the result of confinement. In the other cases—that is, the thirty-two remaining cases—no record is made of the final outcome. Of the eighty-six cases—subject to myomectomy and then delivered at full term, it is most remarkable that there were *three cases of twins*.

I also had some trouble in classifying the operations. Some of them just stated that a Porro operation was done. Some of them never mentioned that, but stated abdominal section or superpubic hysterectomy and various other names. In some of these cases the child was extracted, and then the uterus removed. In other cases the pregnant uterus and tumor were removed

en masse. In some instances, also of the latter kind, pregnancy had not been diagnosticated, and was only found after the uterus was opened.

Altogether I found fifty-eight cases under the heading of Porro operation. Of these five died. All the other cases—that is, 204—were put down as abdominal hysterectomies. In a very few cases total hysterectomy was performed. I did not think it was worth while to separate them. All the rest were amputated at the cervix. Nineteen of these cases died.

RARE CASES.

One was that of T. K. Holmes, who found tubal pregnancy complicating fibroids. Abdominal hysterectomy was performed with recovery.

An unique case was that of Wm. Jepson, where triplets were found. This was also subject to abdominal hysterectomy.

Also, cases of twins have been reported.

Several cases are reported as fibroids that absorbed or disappeared during pregnancy (or immediately afterward) which, however, must be taken with a good deal of allowance although there are only a few cases mentioned. I believe that most of such cases were mistaken diagnoses, and were probably pus tubes and exudates that were absorbed during pregnancy.

RESUME.

Total number of cases subject to abdominal section,		498	
Full term (or nearly so),			117
Recovered,	98		
Died,	17		
	117		
Children living,	89		
Children dead,	11		
Children not stated,	17		
	117		
Cesarean section,		40	
Recovered,	35		
Died,	5		
	40		

Porro,			58
Recovered,	53		
Died,	5		
		58	
Not stated positively,		19	
			117
Pregnant less than seven months, number of cases,		381	
Myomectomy,		150	
Aborted,	22		
Died	13		
Went to full term,	85		
Not stated,	30		
		150	

Cases subject to abdominal hysterectomy sometimes preceded by a Porro, at other times tumor and uterus removed *en masse*. Exact operation not stated.

Total,			231
Abdominal hysterectomy (Porro),		204	
Abdominal hysterectomy, died,	19		
Not stated,		27	
			231
Total number of cases,			498
Full term,		117	
Less than seven months,		381	
			498

	Recovered.	Died.
Cesarean section or Porro full term,	99	18
Myomectomy,	137	13
Abdominal hysterectomy (Porro),	185	19
	421	50
Not stated, 27		
Grand total,		498

CONCLUSIONS.

From this large list of cases it seems to me we can safely draw the following conclusions:

1. Operations for fibroid tumors during pregnancy are not more dangerous than operations without that condition.

2. Operation during pregnancy is indicated in fibroids of the lower uterine segment, and should consist of enucleation of the tumor only.

3. Cases of fibroids at the fundus can be allowed to be undisturbed, unless rapid growth will cause interference with the functions of life.

Herewith I append a list of the cases summarized above, giving just a few of the salient points, and a bibliography giving a total of 342 authors quoted, a number of these being quoted several times.

Adenot.—Patient aged thirty-three years. Gestation of three months. Large fibromyomata, one intraligamentous, another subperitoneal. Cesarean section and amputation of uterus. Extraperitoneal treatment of stump. Recovered.

Appelstedt.—Patient aged thirty-three years. Nine to ten months' gestation. Several myomata, both subperitoneal and interstitial chiefly on anterior wall of uterus. Size varied between lentil and new-born child's head, rather hard except the large one on right side of lower part approaching the cervix. Porro operation, extraction of asphyxiated child. Uterus, tubes and ovaries removed. Recovered. Child healthy.

Baer, B. F.—Patient aged thirty-seven. Five months' gestation. Hard fibroma, the size of a child's head, with pedicle. In the uterus also nodules. Supravaginal hysterectomy. Recovered.

Bain, W.—Patient aged thirty-eight. Intrapartum. Birth of child took place naturally, but severe hemorrhage followed. Placenta imprisoned in fundus uteri by a large fibroid in the posterior wall just above the internal os. Extracted with difficulty. Recovered.

Baldwin, J. F.—Patient aged thirty-three years. Gestation about term. Delivery complicated with fibroids. Cesarean operation. Delivered of twins. Supravaginal hysterectomy. Mother and children all living.

Barnes, F.—Patient aged twenty-two. Myoma, in process of disintegration, attached to right side of uterus. Porro's operation. Tumor, uterus, and ovaries removed. Recovered.

Banga, Henry, reports two cases:

CASE I.—Patient aged thirty-six. Five months' gestation. Two large fibromata, the size of two fists, imbedded in the fundus, and ten smaller ones, ranging between the size of a hazelnut and a small apple, scattered all over the uterus. Hysterectomy, extraperitoneal treatment of stump. Died on the fifth day of sepsis.

CASE II.—Patient aged thirty-four. (?) months' gestation. Principal tumor was a subserous fibroma, at about the level of the internal os, developed into the broad ligament. On the body of the uterus a number of smaller subserous fibromata, others intramural. Supravaginal amputation. Recovered.

Bantock, Granville, reports three cases:

CASE I.—Patient aged thirty-four, three and one-half months' gestation. Two pedunculated tumors, one eleven pounds, the other one and one-half pounds. The former with firm and extensive omental adhesions. Supravaginal amputation. Pedicle fixed in angle of wound. Serre-nœud and two pins. Recovered.

CASE II.—Patient aged forty. Four months' gestation. General fibroid enlargement with hydramnios. Twins. Supravaginal amputation. Pedicle in lower angle of wound Serre-nœud. Recovered.

CASE III.—Patient aged thirty-one. (?) months' gestation. Multiple fibroids with dead retained fetus. Supravaginal amputation. Extraperitoneal treatment of stump. Serre-nœud with two pins. Recovered.

Barrow, David.—Patient aged forty-four. Gestation at porro term. A large fibroid mass filling the pelvic cavity. Operation. The child occupied the upper two-thirds of the tumor, the lower one-third was a mass of fibroids. Living child of six pounds. Recovered.

Baushan, D. W.—Patient aged thirty-seven. Two months' gestation, and uterus contained a mass of fibromata. Owing to the dangerous location of the tumors, hysterectomy was advised. Recovered.

Beaussenat et Nandrot.—Patient aged thirty-three, been married thirteen years, never pregnant before. Menses painful.

(?) months' gestation. Abdominal pain. Intraligamentous fibroma. Hysterectomy. Recovered.

Becking reports three cases:

CASE I.—Patient aged (?). (?) months' gestation. Myoma. Enucleation. Delivery at term.

CASE II.—Patient aged (?). (?) months' gestation. Uterine tumor. Supravaginal amputation. Recovered.

CASE III.—Patient aged (?). (?) months' gestation. Uterine tumor. Supravaginal amputation. Recovered.

Benckiser, A., reports three cases:

CASE I.—Patient aged(?). Gestation at term. Myoma of cervix uteri, size of child's head. Os enlarged. An attempt at replacement of the tumor failed. Then perforation and cranioclasty. During puerperium the myoma became gangrenous, high pyemic fever; it dropped off. Woman recovered.

CASE II.—Patient aged twenty-six, gestation almost at term. Myoma on right side of lower uterine segment, size of man's head. Cesarean section and extirpation of myoma and uterus. Recovered. Child healthy.

CASE III.—Patient aged twenty-six, gestation almost at term; myoma, size of man's head. Infiltrating the whole right side of the lower uterine segment, growing into the broad ligament. Cesarean section and extirpation of myoma.

Bergh, C. A.—Patient aged forty-one. Four months' gestation. In the right hypogastric region a tumor the size of two fists, closely connected with the uterus, a smaller one in the left side. Laparotomy. Recovered. Carried full term.

Betts, F. G., reports two cases:

CASE I.—Patient aged(?). Four to five months' gestation. Adhesive myoma, weighing twenty pounds; prior to operation chronic peritonitis. Myomectomy. Died, seven days post-operation, of peritonitis.

CASE II.—Patient aged (?). (?) months' gestation. Myoma. Supravaginal amputation. Recovered.

Black, J. F.—Patient aged thirty-seven. Gestation at term. Multiple fibroids. Cesarean section and removal of the uterus. Recovered. Living child.

Bland-Sutton, J.—Patient aged(?). Gestation of six months. Fibroid tumor of the uterus. An interstitial fibroid occupied the anterior wall near the fundus and a large fibroid grew from the posterior aspect of the cervix and almost completely occupied

the cavity of the true pelvis. Both fibroids show signs of degeneration.

Boldt, H. J.—Patient aged twenty-eight. Two months' pregnancy. Myoma uteri tightly incarcerated in the true pelvis, abdominal hysterectomy. Recovered.

CASE II.—Patient aged thirty-seven. Myofibroma of uterus, intestinal adhesions. Hysterectomy. Died under operation.

CASE III.—Patient aged(?). Three to four months' gestation. Large tumor forcing uterus into the true pelvis. Uterus and tumor removed. Adnexa retained. Recovered.

Bonifield, C. L., reports two cases complicating fibroid pregnancy:

CASE I.—Patient aged forty. Fibroid tumor complicated by pregnancy. Abdominal section. Supravaginal hysterectomy. The outcome promised later.

CASE II.—Patient aged forty-five years. Gestation of four months. Cesarean section. Behind uterus an enormous fibroma, a portion of the large intestine running across its top. Supra vaginal hysterectomy. Iliac vein uncovered for two inches, large hole torn in the rectum. Recovered.

Bossi, L. M.—Patient aged thirty-seven. Gestation at term. Fibromyomata of uterus. Cesarean section and total abdominal hysterectomy. Living child. Recovered.

Boursier, M.—Patient aged(?). Gestation (?). Pyriform fibroma in left iliac fossa, growing rapidly. Total abdominal hysterectomy. Recovered.

Boyd, F. N., reports four cases:

CASE I.—Patient forty-two. Gestation at term. Pelvic fibroid, pedunculated, fixed by adhesions. Porro-Cesarean section. Living child. Patient died on third day from peritonitis.

CASE II.—Patient aged forty-one. Four to five months' pregnancy. Uterus beset with fibroids, and an intraligamentous fibroma on right side. Supravaginal amputation. Recovered.

CASE III.—Patient aged forty-two. Gestation at term. Pedunculated fibroid of posterior wall, the size of a jaffa orange. A second fibroid the size of a large walnut and the uterus beset with smaller fibroid nodules. Supravaginal amputation after Cesarean section. Child weighed nine pounds. Mother died fifty hours after operation.

CASE IV.—Patient aged twenty-nine Four months' gestation. Multiple myomata. One was intraligamentous and immovable. Supravaginal amputation. Recovered.

Boyd, G. M.—Patient aged (?). Gestation at term. Uterus had many intramural subperitoneal and pedunculated fibroids. Porro-cesarean Section. Child decomposed. Recovered.

Branham, J. H.—Patient aged (?). Gestation (?). Complicated pregnancy by uterine myomata. In a lateral view of the specimen it could be seen where the fetus has been turned out. Patient recovered.

Braun, C. V., reports two cases:

CASE I.—Patient aged (?). Four months' gestation. Myomectomy. Myoma weighed 4,800 g. Recovered.

CASE II.—Patient aged (?). Four months' gestation. Myoma. Supravaginal amputation. Extraperitoneal treatment of stump. Recovered.

Brewis, N. T., reports four cases:

CASE I.—Patient aged (?). Five months' gestation. Uterine tumor. Supravaginal amputation. Recovered.

CASE II.—Patient aged (?). Four months' gestation. Fibrocystic tumor, weighing ten pounds, attached by a pedicle to the uterus. Total hysterectomy. Gauze was placed in the vagina between the clamps and the peritoneum stitched over the gauze and clamps. Recovered.

CASE III.—Patient aged thirty seven, five and one-half months' gestation. Fibroid growing from the posterior aspect of the supravaginal portion of cervix. Cesarean section and supravaginal hysterectomy. Recovered.

CASE IV.—Patient aged thirty-three. Gestation at term. Fibroid on the left side of the lower uterine segment, size of a cricket-ball. From the corpus uteri projected a subperitoneal fibroid situated about one and one-half inches internal to the insertion of the left round ligament. Cesarean section and supravaginal hysterectomy. Child living. Mother recovered.

Briggs, J. E., reports two cases:

CASE I.—Patient aged thirty-eight. Intrapartum. Fibroid entirely filling the pelvis. Cesarean hysterectomy. Child of eight months. Died. Woman recovered.

CASE II.—Patient aged forty-one. Gestation at term Uterine fibroma. Cesarean hysterectomy. Living child. Discharged from hospital on twentieth day. Recovered.

Brindeau, M. A.—Patient aged thirty-two; primipara. (?) months' gestation. Fibroma weighing eight kg., with broad pedicle attached to fundus uteri. Subtotal hysterectomy. (Procédé Américain.) Recovered.

Brodhead.—Patient aged (?). Gestation at term. Pediculated tumor. Springing from posterior uterine wall, with adhesions. Conservative Cesarean section and tumor enucleated. Recovered; living child.

Brohl.—Patient multipara, age not stated. Gestation of seven months. Uterus tamponated, later hysterectomy, containing two months' fetus, which was part fibromated. Recovery.

Buckley, S., reports two cases:

CASE I.—Patient aged twenty-eight. Three and one-half months' gestation. A soft fibromyoma springing from the right side of the uterus, not pedunculated. Was removed by abdominal hysterectomy. Complete recovery. Five months after operation was delivered naturally of a full-term child.

CASE II.—Patient aged twenty-eight. Five and one-half months' gestation. Pedunculated myoma attached to the left corner of the uterus and adherent to the omentum. The pedicle was transfixed and ligatured and the tumor removed. Recovered; pregnancy continued normal.

Bué, V., reports cases:

CASE I.—Patient aged thirty-six. Three months' gestation. Fibroma, the size of a man's head, with numerous pedicles. Uterus infiltrated with fibromatous nodules, its cavity taken up by a fibroma and a fetus of three months. Supravaginal amputation, extraperitoneal treatment of the stump. Recovered.

CASE II.—Patient aged (?). Two to three months' gestation. Uterine fibroma, with fairly broad pedicle, the szie of a fetus' head at term, on the corpus uteri multiple fibromata. Abdominal myomectomy. Aborted three months later. Recovered.

CASE III.—Patient aged thirty-six. Gestation at term. Non-pedunculated fibroma behind the subvaginal portion of cervix, the size of an orange. Delivery with forceps. Tumor enucleated two months later.

Calderini reports three cases:

CASE I.—Patient aged (?). Gestation at term. Myoma of the cervix. Enucleated intrapartum. Recovered.

CASE II.—Patient aged (?). (?) months' gestation. Large myoma of corpus uteri. Extirpated. Recovered (?).

CASE III.—Patient aged (?). Two months' gestation. Cystic myxomatous degenerated myoma. Extirpated. Farther gestation normal.

Cameron, M.—Patient aged thirty-six. Five months' gestation. Irregular tumor, consisting of an interstitial myoma.

Implanted on upper and posterior uterine walls. Several subserous myomata. Abdominal section and total uterus removed. Recovered.

Campbell, John.—Patient aged thirty-five years. Gestation three and one-half months. Laparotomy three. Fibroid tumors in the uterine walls. The larger one equaled in size to a duck's egg. Complicated by a large fibroid of the round ligament adherent in the pouch of Douglas. The uterus with the four tumors was removed by supravaginal hysterectomy. Patient recovered.

Carmalt.—Patient aged thirty-two. Gestation near or at term. Fibromyoma in anterior wall of the cervix and lower uterine segment. Preparations for Cesarean section made, but the uterine contractions lifted the tumor out of the pelvis and drove the child down to the perineum. Child asphyxiated before delivery. Placenta removed manually. Tumor shrank considerably. The next year myomectomy. Recovered and gave birth to a child of ten and one-fourth pounds a year later.

Carstens, J. H., reports seven cases of fibroid operations during pregnancy:

Case I.—Patient's age not stated. Three months' gestation. Abdominal section proved to be a long pedicled fibroid of the uterus. Uninterrupted gestation. Both mother and child recovered.

Case II.—Patient aged twenty-seven years. Three months' gestation. Celiotomy and enucleation of fibroids, the whole uterus being studded with minute fibroids, from the size of a millet seed to a pea. Two months later (it is said) she was delivered with a seven months' child.

Case III.—Patient aged thirty-five years. Four months' gestation. Operation revealed a fibroid of five by two inches. Myomectomy. Farther course of pregnancy not known.

Case IV.—Patient aged thirty-four years. Gestation five months. Three fibroids. Myomectomy. Aborted with severe hemorrhage causing death.

Case V.—Patient aged forty-two years. Gestation four months. Numerous fibroids between the uterus and the bladder were enucleated. Aborted eight days later. Patient recovered.

Case VI.—Patient aged thirty-one years. Abdominal section revealed a pregnancy, uterus with four fibroid tumors, one near the internal os, two at the fundus, one in the culdesac; two more so deeply seated that it was suspected to go through into

the uterine cavity, but it did not quite reach the mucous membrane. Aborted on the seventh day after the operation. Patient recovered.

CASE VII.—Patient aged forty-two years. About four months' gestation. Abdominal hysterectomy. Enucleated the fibroid from broad ligament with supravaginal hysterectomy. Recovered.

Caruso.—Patient aged (?). (?) months' gestation. Uterine fibromyoma. Conservative Cesarean section. Mother died from hemorrhage. Child living.

Chavannaz, Portevin de Fontguyon.—Patient aged (?). (?) months' gestation. Uterine tumors. Entire uterus removed by abdominal hysterectomy. Recovered.

Coe, H. C., reports two cases:

CASE I.—Patient aged thirty-three. Three months' gestation. Large interstitial tumor. Supravaginal amputation. Recovered.

CASE II.—Patient aged forty-four. Four months' gestation. Multiple uterine fibroids filling the entire abdomen and extending as high as the stomach and liver. Abdominal hysterectomy. A four months' fetus was found within a long narrow uterine cavity situated in the midst of the mass of fibroids. Recovered.

Chrobak.—Patient aged thirty-seven. Six months' gestation. Uterine fibromyoma weighing five pounds. The interior contained a mass of necrotic tissue. Supravaginal amputation. Living fetus. Recovered.

CASE II.—Patient aged (?). Gestation near term. Behind the uterus a myoma. It was lifted out of pelvis. Cesarean section. Living child of 2330 gm. Entire uterus removed. Recovered.

Coles, W.—Patient aged (?). Tumor growing from the anterior face of the body of the uterus. Interior of the growth filled with gray flocculi and serum. Enucleated. Left ovary in cystic degeneration. Removed. Recovered. Farther gestation (?).

Condamin, R. reports four cases:

CASE I.—Patient aged thirty-three. Two to three months' gestation. Large subperitoneal mass with pedicle attached to posterior uterine wall. Size of two fists. Myomectomy. Pregnancy undisturbed. Recovered.

CASE II.—Patient aged twenty-nine. Two months' gestation. Fibroma of right cornu, size of fetal head. Myomectomy. Aborted on twelfth day. Recovered.

Case III.—Patient aged thirty-three. (?) months' gestation. Very hard, in some places calcified fibroma. No pedicle, mistaken for ovarian cyst. Laparotomy. Aborted. Recovered.

Case IV.—Patient aged thirty-four. Gestation (?). Fibroma of anterior lateral part of uterus. Myomectomy. Pregnancy undisturbed. Recovered.

Cottin.—Patient aged thirty-seven. Four months' gestation. Fibroma of fundus uteri; broad base. Two smaller tumors on uterine wall. Subtotal hysterectomy. Recovered.

Cordemans.—Patient aged (?). Three months' gestation. Interstitial fibroid of fundus. Abortion feared. Rise of temperature. Discharge. Removal of the entire uterus by abdominal hysterectomy. (Procédé américain.) Recovered.

Croom, J. H., reports two cases:

Case I.—Patient aged thirty-five. Three months' gestation. Soft uterine myoma with a firm pedicle, about as thick as two fingers, passing from the left cornu of the uterus. No difficulty in dealing with it by double knot. The rest of the pedicle was carefully sewed up and dropped back; no further trouble. Patient was delivered at seven months.

Case II.—Patient aged thirty-five. Two months' gestation. A large, rapidly-growing soft fibroid attached to the left side of the uterus by a thin pedicle. Operation, (?). Patient died immediately afterward from old-standing aortic disease.

Cuff, Sheffeld.—Patient aged twenty-five years. Gestation four months. Operation revealed a uterine fibroid equal in size to a fetal head. A smaller fibroid was found below it. Both were enucleated. Patient recovered and pregnancy was uninterrupted.

Debrunner.—Patient aged thirty-five. Gestation at term. Fibroma, the size of child's head belonging to the left broad ligament. The cervix uteri was free. Cesarean section and supravaginal amputation. Recovery. Living child.

Delagénière, H.—Patient aged twenty-eight. Gestation at term. Fibroma blocking the pelvic canal. Porro-Cesarean section. Living child. Recovered.

Delassus.—Patient aged (?). Eight and one-fourth months gestation. Multiple fibroids. Pregnancy had not been diagnosed. Cesarean section and abdominal hysterectomy. Child living. Recovered.

Delétrez.—Patient aged (?). Five months gestation. Uterine myoma. Supravaginal amputation. Recovered.

Demans, M., reports two cases:

CASE I.—Patient aged twenty-eight. Five months' gestation. Ascites. Interstitial tumor in fundus. The uterus distended as if going to burst; had the feel of a cystic tumor. Abdominal hysterectomy and the entire uterus removed. Recovered.

CASE II.—Patient aged thirty-five. Two and one-half months' gestation. To the left of fibroma a fluctuant tumor, growing rapidly, taken for a tubal or ovarian cyst. It was the distended uterus with very thin walls. Total abdominal hysterectomy. Recovered.

Demons-Binand.—Patient aged twenty-eight. Five months' gestation. Tumor consisting of two enlargements separated by a constriction. The more superficial was a soft fibroid with a gangrenous interior. The second enlargement was soft and contained a dead fetus. Total ablation. Recovered (?).

Demons and Laconture.—Patient aged (?). Four weeks' gestation. Uterine fibromata. Supravaginal amputation.

Denné, P.—Patient aged (?). Gestation at term. A myoma the size of a man's head; the interior fatty degenerated. (Conservative) Cesarean section and removal of tumor. Recovered. Living child.

Denny.—Patient aged (?). Gestation at term. Hard fibroma on posterior uterine wall, obstructed labor. Cesarean section. Recovered. Living child. Tumor later removed.

Dietel.—Patient aged (?). Three months' gestation. Myoma of cervix, the size of a fist. Excision of the entire uterus. Two years before a cervical myoma had been enucleated intrapartum. Another myoma of cervix had been left behind. Several months later abortion in seventh to ninth week. Removal of placenta difficult. Tumor had grown in the meantime.

Dirner.—Patient aged forty. Two months' gestation. Interstitial and subserous tumor is generally distributed. Pelvis is blocked; tumor reaching above umbilicus. Supravaginal amputation. Enucleation of cervical tumor. Intraperitoneal treatment of stump. Recovered.

Dixon, A.—Patient aged (?). Gestation at term. Hard and solid large fibroid filling the vaginal outlet. Cesarean section by light of a kerosene lamp on a farm. Died six days after operation.

Döderlein.—Patient aged thirty-eight. Three months' gestation. Uterine myoma. Supravaginal amputation. Intraperitoneal treatment of stump after Zweifel. Recovered.

Doleris, A.—Patient aged thirty-three. Three months' gestation. Fibroma growing from right lateral uterine wall, the size of a child's head. Another springing from superior posterior wall. Hysterectomy. Recovered.

Doléris, Y. A.—Patient aged forty. Seven and one-half months' gestation. Hemorrhagic fibroma on anterior and right lateral wall of uterus. Grew rapidly in seven months. Cachexia. Laparo-hysterectomy. Living child. Recovered.

Donald, A.—Patient aged (?). Four and one-half months' gestation. Multiple fibroids in pelvis below the fetal sac. Whole mass removed by hysteromyectomy. Recovered.

Doran, A., reports cases:

CASE I.—Patient aged thirty. Four months' pregnancy. Large fibroid in the lower segment posteriorly involving the cervix and opening up the broad ligament. Also a subserous fibroid with pedicle. Uterus amputated. Recovered.

CASE II.—Patient aged thirty. Gestation (?). Fibroid with broad pedicle attached to left side of the supravaginal portion of cervix. Hysterectomy. Recovered.

Doran, A. H. G.—Patient aged twenty-eight. Two months pregnant. On left side of uterus an irregular solid subserous fibromyoma, weighing two pounds two ounces. Myomectomy. Enucleated. Carried full term.

Dorman.—Patient aged (?). Gestation at term. Myoma impacting pelvis. Conservative Cesarean section and tumor enucleated. Recovered. Child living.

Downes, Andrew J.—Patient aged thirty-two. Nine weeks' gestation. Seven fibroids; the largest one from the fundus; one quite large extending from the right. The smallest the size of a bean. From the left grew three fairly large fibroids. All subserous. Myomectomy. Enucleation. Right ovary was converted into a cyst. It was removed. True pelvis filled with a firm fibroid growing out from the left side of the uterus at the cervix. Also enucleated. Aborted eighteen hours after operation. Recovered.

Duncan, W.—Patient aged thirty-eight. (?) months' gestation. A soft fibroma growing from the supravaginal cervix down into the vagina and involving the vaginal wall. Abdominal hysterectomy. Recovered.

Dysart, McCaw.—Patient aged (?). Four months' gestation. Large subserous myoma with pedicle. Operation. Recovered.

Edgar, J.—Patient aged (?). Gestation three to four months. Uterine fibromyoma weighing sixteen pounds. Operation. Delivery at term. Recovered.

Ehrendorfer.—Patient aged (?). Four months' gestation. Uterine myoma. Supravaginal amputation. Recovered.

Ekstein.—Patient aged thirty-eight. Gestation at term. Labor lasted nine days. Perforation of fetal skull with instrument of Avard. Removal of placenta manually. Submucous myoma with broad base on uterine wall had obstructed the birth-passage.

Elder, G.—Case I.—Patient aged thirty-seven. Three months' gestation. Large-lobed uterine fibroid blocking the pelvis. Hysterectomy by a modified intraperitoneal method. Secondary hemorrhage eight hours after the operation, necessitating opening the stump. Recovered.

Case II.—Patient aged thirty-five. Gestation at term. Large fibroid obstructed the pelvic outlet. Cesarean section and Porro's operation. Recovered. Living child.

Elischer.—Patient aged (?). Three months' gestation. Uterine myoma. Supravaginal amputation. Placenta previa. Recovered.

Emmet, J. D.—Patient aged thirty. (?) months' gestation. Nine uterine myomata. Myomectomy. Nine tumors removed through eight incisions. Pregnancy not disturbed. Was delivered of healthy child.

Emmet, B. McE.—Patient aged (?). Two to three months' gestation. Two fibroids larger than the two fists projecting in opposite directions from uterine walls. Pedicle of the larger one penetrated through the walls of one cornu. Total uterus removed. Recovered.

Engstrom reports six cases:

Case I.—Patient aged (?). Five months' gestation. Myoma with short pedicle to fundus. Weight 1700 g. Peritonitis before operation. Sanguineous ascites. Died four days after operation from sepsis.

Case II.—Patient aged (?). Four months' gestation. Myoma. Myomectomy. Recovered. Was delivered at term. Pelvic presentation. Child died intrapartum.

Case III.—Patient aged (?). Four to five months' gestation. Myomectomy. Delivery at term. Healthy child.

Case IV.—Patient aged (?). Four months' gestation. Myomectomy. Aborted one day after. Fetus dead and putrid.

CASE V.—Patient aged (?). Five months' gestation. Intramural myoma, the size of a fist. Enucleation. Recovered. Delivery at term.

CASE VI.—Patient aged (?). Five months' gestation. Myoma of the cervix extending to decidua. Enucleation. Delivered of twins two months before term.

Esch reports two cases of myoma of the uterus impeding delivery:

CASE I.—Patient aged thirty-seven years. Gestation at term. Tumor the size of a child's head on the right side of the fundus uteri. Abdominal section, tumor weighed 350 gm. Mother and child both recovered.

CASE II.—Patient aged twenty-eight years. Gestation at term. Tumor on the fundus uteri extending to the arch of the ribs. The size of a child's head filling the entire small pelvis. Abdominal section. The uterus with the myoma weighed 1,800 grains. Mother and child both recovered.

Etheridge, J. H., reports two cases:

CASE I.—Patient aged thirty-four. Three months' gestation. Multilobular fibroma growing from the anterior wall of the corpus uteri. Supravaginal amputation. Died two days after operation from sepsis.

CASE II.—Patient aged forty-three. Four months' gestation. Multilobular myofibroma. Weighing nineteen pounds. Attached to both ovaries. Supravaginal amputation. Recovered.

Evans, H. M.—Patient aged twenty-six. Four months gestation. Supraperitoneal fibromyoma, springing from the left side of the uterus low down, more than three inches in diameter, hard and nodular, with pedicle of about an inch in diameter. The pedicle was ligatured in two portions and the tumor snipped away with strong scissors. No abortion. Recovered.

Everke reports four cases.

CASE I.—Patient aged (?). Four months' gestation. Uterine myoma, the size of two fists. Enucleation. Aborted twelve hours after. Recovered.

CASE II.—Patient aged (?). Three months' gestation. Myoma the size of a child's head. Enucleation. Aborted four weeks after. Sequent to high fever of acute gastrointestinal catarrh.

CASE III.—Patient aged thirty-six. Gestation at term. Retrocervical myoma blocking inlet of pelvis. Conservative Cesarean section and enucleation. Recovered. Living child.

CASE IV.—Patient aged (?). Two months' gestation. Myoma. Supravaginal amputation. Recovered.

Fairchild, D. S.—Patient aged (?). Three months' pregnant. Uterine body was occupied by multiple tumor masses. Supravaginal hysterectomy. Recovered.

Fargas.—Patient aged (?). Five to six months' gestation. Decaying subperitoneal myoma weighing two kg. Symptoms of peritonitis. Operation. Recovered. Delivered at term.

Farr, U. H.—Patient aged thirty-two. Three months' gestation. Profuse and almost continuous hemorrhage. Fibroma nearly as large as the head of a child, hard fibrous attachment extending from the internal os to the fundus on the right side with a band of adhesions to the left side. Tumor removed. Aborted. Recovered.

Favell.—Patient aged (?). Six months' gestation. Large fibromyomata in lower uterine segment. Hysterectomy. Recovered.

Fehling-Kettlitz.—Patient aged (?). Gestation at term. Myoma in pelvis. Cesarean section and supravaginal amputation. Died seven days after operation from edema of the lungs. Child died fourteen hours after operation.

Fenwick, Bedford, reports two cases:

CASE I.—Patient aged forty. Three months' gestation. Fibroma moulded into the pelvis with dense adhesions between its under surface, the rectum and the floor of the pelvis. Hysterectomy. Below the uterine cavity, above it and all around were dense masses of fibroma tissue. Recovered.

CASE II.—Patient aged thirty-six. Four months' gestation. Impacted fibroid. Supravaginal hysterectomy. Recovered.

Fernandes.—Patient aged (?). Intrapartum. Uterine myoma. Supravaginal amputation. Twelve hours before operation rupture of the membranes, prolapse of umbilical cord. Child died. Recovered.

Fernwald, v., G. B., reports six cases:

CASE I.—Patient aged forty. Intramural myomata. Multiple myomata of cervix. Aborted in three month. Supravaginal amputation. Extraperitoneal treatment of stump. Recovered.

CASE II.—Patient aged thirty-four. Gestation at term. On posterior wall of uterus a myoma the size of child's head, immovable. Cesarean section and myomectomy. Living child. Myomata removed weighing 1,350 gm. Recovered.

CASE III.—Patient aged forty. Gestation at term. Intramural myoma of uterus. Conservative Cesarean section. Enucleation of myoma. Living child. Recovered.

CASE IV.—Patient aged thirty. Gestation at term. Intramural fibromyoma, the size of a child's head. Delivery with forceps. Living child. Involution of myoma. Recovered.

CASE V.—Patient aged thirty-five. Three months' gestation. Subserous fibroma uteri. Conservative myomotomy. Recovered.

CASE VI.—Patient aged forty-four. Four months' gestation. Multiple intramural fibromata. Supravaginal amputation. Extraperitoneal treatment of stump. Recovered.

Finet.—Patient aged (?). (?) months' gestation. Frequent, partly profuse metrorrhagia. Multilobular uterine tumor, filling up chiefly the small pelvis. Entire uterus removed by abdominal hysterectomy.

Flaischlen, Nicolaus.—Patient aged thirty-two. Three month's gestation. Two uterine fibromata. The larger one connected with posterior wall of uterus, to the left. The other, size of apple, with broad base on anterior wall. Pedicle ligatured, the not pedunculated tumor enucleated. Recovered. Delivered at term of a living child without medical aid.

Frank reports cases:

CASE I.—Patient aged thirty-four. (?) months' gestation. Myoma of the portio supravaginalis, the size of a man's head. Laparotomy. Enucleation. Fourteen days later, abortion. Fetus fetid. Recovered.

CASE II.—Patient aged (?). Seven weeks' gestation. Tumor reaching above the umbilicus. Supravaginal amputation. Recovered.

CASE III.—Patient aged forty. (?) months' gestation. Multiple myomata uteri. Laparotomy. Carried full term. Recovered.

CASE IV.—Patient aged forty-two. Four months' gestation. Myoma uteri. Grave symptoms of incarceration. Laparotomy. Supravaginal amputation. Retroperitoneal treatment of stump. Recovered.

CASE V.—Patient aged twenty-eight. Gestation at term. Myoma springing from posterior wall of cervix. Delivered of a strong, healthy child. Half a year later, myectomy and amputation. Recovered.

CASE VI.—Patient aged (?). (?) months' gestation. Gangrenous, bad-smelling tumor, protruding from vulva. Bladder filled up to umbilicus. Child dead. Perforation and removal with cranioclasts. The next day fever and meteorismus. Vaginal extirpation. Died on third day from sepsis.

CASE VII.—Patient aged (?). Myomata uteri. Spontaneous abortion in fourth month of pregnancy. Tumors, having become gangrenous. Removed with dressing forceps. Recovered.

Frank, E.—Patient aged thirty-nine. Gestation at term. Myoma of supravaginal part of uterus. Grown during pregnancy from the size of a fist to child's head. Laparotomy. Child of 2,900 gm. Enucleation and supravaginal amputation. Child living, and mother recovered.

Frankel reports two cases of myomatous uterus with pregnancy.

CASE I.—Patient aged forty-eight years. Gestation seven months. Laparatomy. Supravaginal amputation of the myomatous uterus. Weight of tumor and uterus 3,612 gm. Immediate death of the fetus. Patient recovered.

CASE II.—Patient aged thirty-nine years. The uterus contained a two months' fetus. The tumor was attached to the left side of the uterus. The microscope confirmed a typical fibromyoma. Results not stated.

Frascani.—Patient aged (?). (?) months' gestation. Several uterine myomata. Cesarean section and supravaginal amputation. Recovered. Child living.

Freund, H.—Patient aged(?). Gestation (?). Supravaginal amputation of the uterus with a necrotic myoma and in the right fundus ovum in the fifth week. Results not stated.

Fritsch.—Patient aged (?). (?) months' gestation. Uterine myoma. Supravaginal amputation. Extraperitoneal treatment of pedicle. Recovered.

Frommel, R., reports four cases:

CASE I.—Patient aged (?). Six months' gestation. Myoma on fundus with very short pedicle. Myomectomy. Aborted the second day without noticeable labor pains. Died the third day from hemorrhage of stump.

CASE II.—Patient aged thirty. Six months' gestation. To the right of the uterus a myoma, the size of a hen's egg. Pedicle one and a half cm. Laparotomy. Patient left hospital twenty-one dyas after; a few days before quickening was noticed.

CASE III.—Patient aged forty-three. Five months' gestation. Myoma, the size of a child's head, on right uterine wall. With thin adhesions to the surrounding tissues. Previous symptoms of peritonitis due to softening of tumor. Enucleation. Pregnancy not disturbed.

CASE IV.—Patient aged thirty-six. Four months' gestation. Intraligamentous myoma with pedicle attached to uterus. Enucleation. Gestation not disturbed.

Fry, H. D.—Patient aged (?). Two months' gestation. Large multinodular uterine myoma. Entire uterus removed by hysterectomy. Recovered.

Galvani, J.—Patient aged forty. Six months' gestation. Large subperitoneal myoma and small nodules in uterus. Tumor and uterus mistaken for a segment of the tumor. Removed at the same time. The collum, being segmented, had no communication with corpus. Recovered.

Gemmell, J. E.—Patient aged thirty-six years. Missed her period three weeks part of the time. Operation a month later. Abdominal incision. Large tumor pedunculated from the upper portion of a multiple fibromyomatous uterus. Supravaginal hysterectomy. Result not stated.

Gibb, Joseph S.—Patient aged (?). Gestation at term. Myoma with pedicle springing from posterior uterine wall; many adhesions. Cesarean section two days after first labor pains. Tumors removed. Died three days after from peritonitis. Child living.

Gillette, W. J.—Patient aged (?). Primipara. Gestation at term. Fibroma on posterior wall near the fundus, pedicle the size of a wrist. Porro-Cesarean operation. Child living. Patient recovered.

Gohndorf.—Patient aged thirty-two years. Supposed gestation of eight months. Laparotomy. The tumor and uterus with the entire adnexa removed. The uterus was fibromatous with many small and large dimensions which were mistaken for the fetus. In the cavum uteri laid a two months' fetus. Results not stated.

Gordon, S. C.—Patient aged thirty-five. (?) months' gestation. Fibroid ovoid in character, with sessile attachment to the middle of the front of the uterus. Enucleation. Rapid recovery. Delivery at full term. Healthy child.

Gow, W. J.—Patient aged thirty-seven. Eight months' gestation. Multiple myomata. One of them in Douglas's pouch.

Porro's operation. Extraperitoneal treatment of stump. Child weighed five and three-fourths pounds, living. Recovered

Gross.—Patient aged (?). Gestation (?). Uterine fibroma. Twisted pedicle. Myomectomy. Carried full term. Recovered.

Guermonprez.—Patient (?). Multiple fibroid. Cesarean section and abdominal hysteromyomectomy. Living child. Recovered.

Guinard, A.—Patient aged thirty-three. Five months' gestation. Myoma, the size of fetal head at term, in the right broad ligament. Myomectomy. Recovered. At seven and one-half months of gestation delivery.

Gutierrez, E.—Reports two cases:

CASE I.—Patient aged thirty-nine. Gestation at term. Multiple fibromata. The inferior tumor blocking the birth-passage. Cesarean section and total extirpation of uterus after the method of Doyen. Recovered. Child living.

CASE II.—Patient aged thirty-three. (?) months' gestation. Subperitoneal fibroma, firmly attached to posterior part of uterus. Cesarean section and total abdominal hysterectomy. Weight of child 3,100 gm., of uterus and fibroma 2,520 gm. Living child. Recovered.

Hamill, R. H.—Patient aged twenty-four. Gestation seven weeks before term. Large myofibroma, fatty degenerated, with dense adhesions to lower margin of liver measuring 22 x 17 x 21 cm. Pedicle measured 8 x 5.5 cm. Celiotomy. Tumor and uterus removed at the junction of the lower uterine segment and cervix. Stump dropped and covered with peritoneum. Recovered. Living child.

Hamilton, J. A. G.—Patient aged thirty-six. Ten weeks' pregnancy. Two fibroids about the size of a tennis-ball, attached to and springing from the uterus, near the fundus, pedunculated. Delivered with forceps. Two fibroids enucleated three days later. Recovered.

Hargrave, E. T.—Patient aged thirty-nine. Intrapartum. Partial craniotomy. Uterine fibroid. Child had been dead several hours. Died on the way to hospital.

Hanks.—Patient (?). Eight months' gestation. Fibroma in cervix uteri and the posterior wall of the corpus at beginning of pregnancy. Was delivered at eight months and no sign of tumors could be discovered. Retrograde metamorphosis or absorption during pregnancy.

Hauser, Carl.—Patient aged thirty-six. Three months' gestation. Interstitial and subperitoneal. Hard tumor on uterus,

size ranging from hazelnut to child's head. Supravaginal amputation. The whole fibromyomatous mass weighed with uterus 2,800 gm. Recovered.

Heinricius reports four cases:

CASE I.—Patient aged (?). Three months' gestation. Two small myomata on corpus uteri. Myomectomy. Aborted a few weeks after operation. Recovered.

CASE II.—Patient aged (?). Six months' gestation. Myoma with broad pedicle. Myomectomy. Recovered. Carried full term.

CASE III.—Patient aged (?). (?) months' gestation. Myoma uteri. Supravaginal amputation. Recovered.

CASE IV.—Patient aged thirty-nine. Three months gestation. Multiple myomata. Myomectomy after Chrobak. Recovered.

Hellier.—Patient aged thirty-three. Five and one-half months' gestation. Multiple myomata. Supravaginal amputation. Recovered.

Hengst, D. A.—Patient aged thirty-six. Two to three months' gestation. Multiple fibromata of uterus. Badly diseased kidneys. Died before operation.

Hermann, G. E.—Patient aged thirty-six. Gestation at term. Uterus retroflexed by a fibroid attached to its posterior wall. Cesarean section, child decomposing. Porro's operation and uterus removed. Died four days after operation. Living child.

Hinsdale, Guy.—Patient aged twenty-six years. Primipara. Delivery complicated necessitating Cesarean section. A large pedunculated fibroid was found attached to the uterine neck and another near the fundus. Mother and child both died.

Hofmeier, M., reports seven cases:

CASE I.—Patient aged (?). Six months' gestation. Myoma, size of a goose egg. Laparotomy. Amputation of the body of the uterus. Recovered.

CASE II.—Patient aged twenty-nine. Three to four months' gestation. Large hard myoma with thick pedicle. Omental adhesions. Myomectomy. Aborted three days after. Recovered.

CASE III.—Patient aged (?). Two months' gestation. Multiple myomata. Supravaginal amputation. Elastic ligature. Recovered.

CASE IV.—Patient aged (?). Three months' gestation. Multiple myomata. Supravaginal amputation. Elastic ligature. Recovered.

CASE V.—Patient aged (?). Multiple myomata. Cesarean section and supravaginal amputation. Recovered. Living child.

CASE VI.—Patient aged thirty-two. Gestation at term. Myoma, the size of one and one-half of a child's head, growing from posterior uterine wall. Porro-Cesarean section. Living child. Mother recovered.

CASE VII.—Patient aged thirty. (?) months' gestation. In fundus uteri hard myoma, size of child's head. Porro-Cesarean section. Living child. Recovered.

Holland.—Patient aged thirty-seven. Seven months' gestation. Multiple myomata, one of them weighing ten pounds. Porro's operation. Pedicle of tumor treated extraperitoneally. Child lived three hours. Recovered.

Holmes, T. K., reports cases:

CASE I.—Patient aged (?). Four months' gestation. Solid fibroid of the right side of the uterus. Enucleated by splitting the capsule and cavity closed by a continuous suture. Recovered. Confined at full term.

CASE II.—Patient aged forty. Four months' gestation. Irregular uterine fibroid. Distress from pressure symptoms. Complete hysteromyomectomy. Recovered.

CASE III.—Patient aged (?). Gestation (?). In walls of uterus seven fibroids varying in size from a walnut to a large orange. Total abdominal hysterectomy. Tubal pregnancy. Recovered.

CASE IV.—Patient aged thirty-four. Four months' pregnancy. Myoma of the right iliac fossa. Enucleated. A month after abortion. Violent abdominal pains. Vomiting persistent, abdomen reopened. Died four hours after.

Homan, J.—Patient aged (?). Three months' gestation. Aborted. Laparotomy. Recovery.

Horrocks, I.—CASE I.—Patient aged thirty-five, been married seventeen years; had had eight children and six miscarriages Five months' gestation. Profuse hemorrhage. Miscarriage at about five months' gestation. Ergot given, rapid improvement. Fibrous mass in left side. Had not been influenced by pregnancy.

CASE II.—Patient aged (?). Primipara. Five months' gestation. Two fibromata, blended in the greater part of their length. Abdominal hysterectomy. During operation the fibroid enucleated easily from the cellular tissue in the broad

ligament, the attachment to the uterus more by vessels and connective tissue than by continuity of tumor. Recovered.

Horwitz reports a case of a patient aged (?). Five months' gestation. Intraligamentous tumor, the size of a man's head, with a pedicle. No abortion. Recovered.

Ill, E. J.—Patient aged thirty-four years. Fibromyoma complicating pregnancy. Uterus removed above the cervix. Supravaginal amputation. The weight of the specimen was 5,500 gm. A spongy gray substance was removed from the uterine wall which was a dead ovum. Result not stated.

Ivanoff, W.—Patient aged twenty-four years. Gestation three months. Torsion of a gravid fibrous uterus. Operation. On opening the uterine cavity the fetus was discovered, the remainder of the uterus was occupied by a bulky fibromyoma. The entire mass weighing fifteen pounds. Patient died from shock on the fifth day.

Jacobs reports two cases:

CASE I.—Patient aged (?). Five months' gestation fibroma, size and weight (?), with a pedicle attached to posterior wall of uterus. Impacting the pelvis. Character of operation (?). Recovered.

CASE II.—Patient aged (?). (?) months' gestation. Location and character of tumor (?). Operation. Aborted twelve days after operation. Recovered.

Jahreiss, R.—Patient aged forty. Gestation at term. Two myomata, larger than a fist. The one growing from left side of fundus subserous pedunculated with adhesions to omentum; the other, also subserous on anterior uterine wall. Cesarean section and supravaginal amputation of uterus. Recovered. Living child.

Jepson, William.—Patient aged thirty-six. Three months' gestation. Uterus studded with interstitial and subserous myomata. A large pedunculated one was located in the right hypochondriac region under the liver, occluding the true pelvis a myoma developed from the cervical segment of the uterus. Hysterectomy. Extraperitoneal treatment of stump. Uterus contained three fetuses. Recovered.

Jesset, F. R., reports two cases:

CASE I.—Patient aged thirty-nine. Two to three months gestation. Fibroma hour-glass-shaped: upper a large tumor, extending from fundus uteri; lower a larger one, greatly compressed. Wedged between the uterus about the size of a cocoa-

nut with fetus. Abdominal subperitoneal hysterectomy. Recovered.

CASE II.—Patient aged forty. Four months' gestation. Tumor reaching above the umbilicus. Excision of the entire uterus. Fetus had been dead for some time. Recovered.

Jewett.—Patient aged (?). Eight months' gestation. Fibroma springing from the left wall of the body and cervix. The growth filled nearly the lower two-thirds of the uterus. Delivery by Cesarean section. Uterus removed by Doyen's method. Weight of tumor and uterus eight pounds. Woman died thirty-six hours later from exhaustion. Child living.

Johnson, J. T., reports two cases.

CASE I.—Patient aged (?). Five months' gestation. Large fibroid tumor. Supravaginal hysterectomy. Recovered.

CASE II.—Patient aged (?). Four months' gestation. Uterine tumor. Myomectomy. Carried full term. Living child.

Johnstone, A. W., reports cases:

CASE I.—Patient aged (?). Fibroid tumor as large as a baby's head at the time of labor, situated on fundus uteri. Six months afterward not larger than a turkey egg. No trouble in subsequent pregnancy.

CASE II.—Patient aged (?). Four months' gestation. Mass of fibroids around the pregnancy. Sac. Operation. Uterine arteries considerably dilated. Recovered.

CASE III.—Patient aged (?). Five months' gestation. Fibroid attached to peritoneum, back of the vagina. Panhysterectomy. Uterus contained seventeen fibroids. Recovered.

Josserand, Nové.—Patient aged thirty. Four months' gestation. Fluctuant fibroma reaching to hypogastrium. Laparotomy and hysterectomy. Recovered.

Judd, A. M.—Patient's age not stated. Gestation of five months. Inevitable abortion. Duhrrsen incision. Removed a pedunculated uterine fibroid. Patient recovered.

Kalabine.—Patient aged thirty-six. Seven months' gestation. Two uterine fibromata. Was delivered at term; before labor. Pains in lumbar region, constipation. Tumor diminished in size after some time. That of posterior wall had disappeared.

Kaltenbach reports two cases:

CASE I.—Patient aged thirty-two. Five months' gestation. Uterus infiltrated with several small fibromata and one with broad base, larger than the uterus itself. Supravaginal amputation. Tumor weighed 3350 gm. Recovered.

CASE II.—Patient aged thirty-three. Three months' gestation. Interstitial fibromyoma of anterior wall, larger than man's head and softening center. Supravaginal amputation. Extraperitoneal fixing of pedicle. Recovered.

Kaltenbach, Voigt.—Patient aged thirty-two. Gestation at term. Myoma, larger than a child's head, attached to cervix and lower part of corpus. Cesarean section. Living child. Uterus and tumor removed. Extraperitoneal treatment of stump.

Kaltenbach and Vogel.—Patient aged (?). Five months' gestation. Uterine myoma. Supravaginal amputation. Extraperitoneal care of pedicle. Recovered.

Kannegiesser, N.—Patient aged (?). (?) months' gestation. Uterine tumor. The entire uterus removed by abdominal hysterectomy. Recovered.

Karstroem.—Patient aged (?). Five months' gestation. Intraligamentous retroperitoneal myoma. Supravaginal amputation. Recovered.

Kaschkaroff.—Patient aged (?). Five months' gestation. Cystocarcinoma of both ovaries and carcinomatous nodules on fundus uteri. Hysterectomy. Stump treated with elastic ligature enveloped in a large piece of omentum. Recovered.

Kelleher, T. F.—Patient aged thirty-two years. Gestation at term. Cesarean section. Uterus and a pedunculated fibroid tumor originating from the lower half of the posterior uterine wall was removed. Supravaginal hysterectomy. Mother and child both living.

Kelly.—CASE I.—Patient aged (?). Gestation at term. Myoma the size of a large orange springing from the posterior wall of the cervix and two of smaller size on the anterior wall of the fundus. Porro-Cesarean operation, modified by dropping the pedicle. Child died the next day. Patient recovered.

CASE II.—Patient aged twenty-six. Gestation two months. Myoma reaching above the umbilicus. Hysterectomy. Uterus removed through the abdomen. Recovered.

Kerr, J. M. M.—Patient aged twenty-five. Tumor discovered during miscarriage. Removed. Recovered.

Kidd.—Patient aged forty years. Gestation at term. The whole pelvis blocked with myomatous growths. Panhysterectomy. Child was dead. Recovered.

Kirkley, C. A.—Patient aged thirty-five. Gestation at term. Large fibroma completely wedging the body of the child within

the cavity of the uterus. Tumor not diagnosed, so craniotomy. Died the next day. The tumor was about as large as a child's head at term. Pedicle resembled the neck of a child.

Kempe, G.—Patient aged thirty-four years. Gestation full term. Solid fibromyoma tumor springing from the posterior uterine wall. Abdominal section. Mother and child both recovered.

Kleinhaus, F., reports five cases:

CASE I.—Patient aged thirty-five. Four to five months' gestation. Myoma, the size of child's head with pedicle on right half of anterior uterine wall. Ligation of pedicle with rubber tube. Tumor removed. Recovered. Pregnancy not disturbed.

CASE II.—Patient age thirty-two. Four and one-half months' gestation. Edematous myoma of right uterine wall, twisted pedicle, necrotic on its surface. Pedicle ligatured and tumor removed. Pregnancy not disturbed.

CASE III.—Patient aged forty-four. Eleven weeks' gestation. Two broad subserous myomata on anterior and one on posterior wall. Enucleation and castration. Aborted the next day. Recovered.

CASE IV.—Patient aged thirty-eight. Two months' gestation. Subserous myoma, high on anterior wall, broad base, weight 4,750 gm. Supravaginal amputation. Recovered.

CASE V.—Patient aged thirty-nine. Three months' gestation In posterior wall to the right, an interstitial myoma, the size of a child's head. On posterior wall of cervix a tumor of the same size. Supravaginal amputation. Recovered.

Kleinwachter, L.—Patient aged thirty-three. Intrapartum. Painful labor. Spontaneous delivery of dead child. Symptoms of maceration. Examination showed hard tumors in anterior wall of corpus and fundus, also a myoma in cervical wall, causing the extreme pain during labor.

Klotz.—Patient aged thirty-seven. Six months' gestation. Fibroma of cervix, the size of three childs' heads, entirely filling up small pelvis. Difficult hysteromyomectomy. Recovered.

CASE II.—Patient aged thirty-one. Gestation at term. Cesarean section and supravaginal amputation. Secondary laparotomy on fourth day on account of ileus. Patient committed suicide four days after operation. Living child.

Kustner.—Patient aged (?). Four months' gestation. Uterine myoma. Its capsule was attached by sutures to abdominal wound. Aborted four weeks after.

Landau, L., reports six cases.

CASE I.—Patient aged thirty-three. Five months' gestation. Two pedunculated myomata. Myomectomy. Carried complete term. Recovered.

CASE II.—Patient aged (?). Four months' gestation. Two subserous myomata. Myomectomy. Recovered and was delivered at term.

CASE III.—Patient aged thirty. Three months' gestation. Pedunculated subserous fibroma, larger than a man's head. with numerous adhesions. Myomectomy. Delivery at term. Healthy child.

CASE IV.—Patient aged (?). Four months' gestation. Fibroma on anterior wall, the size of a fist. Enucleation. Recovered. Delivery at term. Healthy child.

CASE V.—Patient aged (?). Two to three months' gestation. Myoma, the size of a fist. Enucleation. Delivery at term.

CASE VI.—Patient aged (?). Five to six months' gestation. Two myomata, the size of a fist and a walnut. Enucleation. Delivery at term.

CASE VII.—Patient aged thirty-one. Four months' gestation. Multiple myomata. Abdominal hysterectomy. Adnexa also removed. Died thirteen days after operation from emboli of both lungs.

CASE VIII.—Patient aged thirty-six. Three months' gestation. Intraligamentous fibroid on right side. Attempt to enucleate it. Impossible to stop hemorrhage. Besides multiple fibromata. Abdominal hysterectomy. Isolated ligature of vessels. Closure of vagina and covering with peritoneum. Adnexa left behind. Recovered.

CASE IX.—Patient aged thirty-six. Four months' gestation. Retrouterine myoma of corpus, broad base incarcerated pelvis. Abdominal hysteromyomectomy. Adnexa left behind. Isolated ligature of vessels. Vagina closed and covered with peritoneum. Recovered.

CASE X.—Patient aged thirty-one. Three months' gestation. Multiple fibroids. One of them retrouterine, impacted in pouch of Douglas. Abdominal hysteromyomectomy. Adnexa also removed. Bleeding stopped by angiotripsy. Vagina closed and covered with peritoneum. Recovered.

Landau, L., and *Th.*—Patient aged twenty-eight. A large immovable retrocervical fibroid and numerous small interstitial

and subserous myomata. Cesarean section and amputation of the uterus. Recovered. Living child.

Landau, Th.—Patient aged thirty-nine. Three to four months' gestation. Multiple fibroids. Abortus incipiens. Panhysteromyomectomy. Right adnexa inflamed and removed, on left side left behind. Ligature of broad ligaments. Closing of vagina and covering over with peritoneum. Recovered.

Lannelongue.—Patient aged thirty-six. Three months' gestation. Tumor weighing 9 kg., for the greater part a fibromatous mass, filling up the entire fundus of the uterus. Supravaginal amputation afer Guermonprez. Recovered.

Langshear, E.—Patient aged twenty-eight. Intrapartum. A submucous fibroid with sessile base was with difficulty pushed back sufficiently to permit extraction of the child with forceps. Attempts at delivery of the tumor gave such furious hemorrhage that manual compression of the fundus was resorted to. Later the base of the tumor was curetted away. Hysterectomy necessary for two other tumors, but patient refused operation.

Lanenstein.—Patient aged (?). (?) months' gestation. Tumor (?). Operation (?). No abortion. Recovered.

Lauwers reports three cases:

Case I.—Patient aged (?). Three months' gestation. Pedunculated uterine tumor. Supravaginal amputation. Extraperitoneal treatment of stump. Recovered.

Case II.—Patient aged (?). Three months' gestation. Uterine myoma. Supravaginal amputation. Extraperitoneal treatment of stump. Recovered.

Case III.—Patient aged (?). Three months' gestation. Uterine myoma. Supravaginal amputation. Extraperitoneal treatment of stump. Secondary laparotomy on account of ileus. Died.

Leopold, Lange.—Patient aged (?). Six months' gestation. Character and location of tumor (?). Recovered after operat on.

Leopold, G.—Patient aged (?). Four months' gestation. Uterine myoma. Peritonitis. Supravaginal amputation. Recovered.

Lepage, G.—Patient aged (?). (?) months' gestation. Myoma, deeply situated. Cesarean section and supravaginal amputation. Child living. Recovered.

Lepage, G. and *Monchotte.*—Patient aged twenty-seven. (?) months' gestation. Firm, mobile, whitish tumor of uterus,

base 4 cm. Uterus rotated to the right. Myomectomy. Recovered.

CASE II.—Patient aged twenty-eight. (?) months' gestation. A very hard fibroma attached to right uterine cornu, very broad pedicle, twisted. Uterus rotated. Myomectomy. Recovered. Carried full term.

Lewers, A. H. N., reports two cases:

CASE I.—Patient aged forty-two. Gestation at term. Fibroid in the right broad ligament. Cesarean section. Living child. Recovered.

CASE II.—Patient aged thirty-five. Gestation at term. A fibroid growing from the supravaginal cervix and extending down between the peritoneum and vagina and lower between the vaginal wall and rectum. Cesarean operation. Living child. Recovered.

Ligterink.—Patient aged (?). Four months' gestation. Dermoid cyst of left ovary and subserous uterine fibroma with pedicle. Extirpation of both tumors. No abortion. Recovered.

Lipscher, M.—Patient aged (?). Five months' gestation. Fibromyoma of uterus. Total abdominal hysterectomy. Recovered.

Lohlein reports two cases:

CASE I.—Patient aged thirty-five. Two months' gestation. Fibromyoma springing from corpus uteri, partly in decay. Operation, opening of cavum uteri carefully avoided. Two days after operation abortion. Recovered.

CASE II.—Patient aged (?). One month's gestation. Fibroma size of man's head, partly softened. Operation. Aborted the day after. Recovered.

Lomer.—Patient aged (?). Four months' gestation. Large myoma in small pelvis. Metrorrhagia. Total abdominal hysterectomy. Recovered (?).

Ludwig.—CASE I.—Patient aged (?). Four months' gestation. Subserous myoma on fundus, the size of a man's head. Axis rotation of uterus 180 degrees. Uterus and adnexa in high degree hyperemic from engorgement. Entire uterus removed by abdominal hysterectomy. Recovered.

CASE II.—Patient aged (?). Eighteen weeks' gestation. Rather soft myoma growing from posterior uterine wall, the size of a child's head. Abdominal hysterectomy. Patient recovered.

Lyle, R. P. R.—Patient aged thirty-one years. Gestation full term. Fibroid tumor in the center of the uterus, numerous

small growths, the whole mass weighing fifteen ounces. Abdominal section. Both patients fully recovered.

Madden, M.—Patient aged (?). Four months' gestation. Fibromata. Supravaginal amputation. Died five days after operation from peritonitis.

Madden, Th. M.—Patient aged thirty-three. Two months' pregnancy. Tumor of enormous size growing from the fundus uteri. Gravid uterus. Removed by abdominal section. Died a few days after operation.

Mackenrodt reports three cases:

CASE I.—Patient aged (?). Three months' gestation. Myoma. Myomectomy. Recovered. Carried full term.

CASE II.—Patient aged (?). Three months' gestation. Uterine myoma, in decay. Enucleation. Recovered. Carried full term.

CASE III.—Patient aged thirty-eight. Three months' gestation. Two immovable myomata, the size of a fist, partly in posterior uterine wall. Enucleated by posterior colpotomy. Recovered. Pregnancy not disturbed.

MacLaren, Archibald, reports five cases of uterine fibroids complicating pregnancy:

CASE I.—Patient aged thirty years. Gestation about two months. Miscarriage Tumor as large as an orange. Tumor removed by the vagina with forceps and fingers. Recovered.

CASE II.—Patient aged about thirty years. Gestation not stated. Miscarriage four months previous. A sloughing intrauterine fibroid was removed with sponge, forceps and fingers. Recovered.

CASE III.—Patient aged thirty years. Four months' gestation. Operation. Exploratory opening; found a pregnant uterus with three separate subperitoneal fibroid tumors on the right side. Term continued. Normal delivery. Recovery.

CASE IV.—Patient aged thirty-five years. Fell down stairs. Miscarriage. Four months' gestation. Laparotomy. Two large pedunculated fibroids attached to the fundus, three smaller tumors about the anterior wall of the bladder. Continued to full term. Recovered.

CASE V.—Patient aged thirty years. Gestation not stated. Removal of the tumor through the vagina as large as a fetal head. Delivered with twins. Mother and children living.

Malcolm, J. D., reports:

CASE I.—Patient aged thirty-two years. Fifty-four days after delivery enucleation of uterine fibroids. The larger one in process of sloughing. Recovered.

Malcolm, McLean.—Patient aged thirty-three. Multipara. Three months' pregnancy. Uterus contained a mass of nodular fibromata. Removal of the entire uterus. Recovered.

Markoe, J. W.—Patient aged twenty-six years. Gestation at term. Myoma of the uterus complicating delivery. Cesarean section. Hysterectomy. Tumor involving the mucous surface of the uterus. Mother and child both living.

Martin, A., reports five cases:

CASE I.—Patient aged thirty-seven. Four months' gestation. Myoma of the corpus uteri in the lower segment. Myomectomy. Recovered.

CASE II.—Patient aged (?). Four weeks' gestation. Myoma of lower segment of corpus and cervix, the size of a fist. Laparotomy. Total excision of uterus, tumor and appendages Recovered.

CASE III.—Patient aged (?). Seven months' gestation. Very large myoma uteri. Total excision of uterus. Tying to the bladder during operation was overlooked. Died on third day of peritonitis.

CASE IV.—Patient aged (?). Three to four months' gestation. Intraligamentous myoma. Enucleated on technical grounds. Total excision of uterus.

CASE V.—Patient aged thirty-seven. (?) months' gestation. Large extremely hard myoma filling the pelvis. Besides the body of uterus infiltrated with myomatous nodules. Large tumor enucleated and the whole uterus removed. Recovered.

Martin, R, reports a case of a patient aged (?). (?) months' gestation. Multiple subserous myoma. Ventrofixation. Operation (?). Recovered. Delivered after term of a dead child.

Martin, F. H.—Patient aged forty-two. Two months' gestation. Multiple fibroids interfering with normal labor. Above the fetus a rather large fibroid which would have prevented the uterus from developing. Complete hysterectomy. Recovered.

Marx, S., reports two cases:

CASE I.—Patient aged (?). Primipara. Kyphotic spine. Seven months' gestation. Uterine tumor. Cesarean section at term advised and accepted. Simple forceps operation delivered her of a seven-pound baby.

CASE II.—Patient aged (?). Gestation at term. Intra-ligamentous fibroma blocking the entire pelvis. Intra-Cesarean section. Recovered. After two months tumor only size of a bean.

Manclaire, M.—Patient aged thirty-two. Fibroma size of fist attached to right of uterus on fundus a smaller subperitoneal, pedunculated fibroma. Aborted at two months' gestation. Fever. Curettage. Suppuration from os. Greenish pus. Supravaginal hysterectomy. Recovered.

Maygrier.—Patient aged thirty. Seven months' gestation. An almost sessile fibroma on right uterine wall. Uterus rotated. Myomectomy. Recovered. Confinement at eight and one-half months. Living child.

Mayo, W. J.—Patient aged (?). Gestation at term. Fibroid the size of a child's head. Porro's operation. Tumor with uterus cut away. Recovered. Living child.

McArthur, A. N.—Patient aged thirty. Four months' gestation. Tumor between the layers of the broad ligament as large as the head of seven months' fetus, encapsulated, quite firm. Incorporated with the cervix. Colpotomy. Three weeks after abdomen opened for enucleation. Tumor not removed, decided the woman would have to go to term and undergo a Cesarean operation. Delivered with forceps of living child; on the eleventh day discharged. No trace of tumor could be detected. Cause of disappearance (?).

McGannon, M. C.—Patient aged (?). (?) months' gestation. Fibroma fixed to the pelvis in such a way as to hold the uterus in a rotated position. Myomectomy. Recovered.

Meheut reports eight-five cases of pregnancy with myoma (1895–1900). In sixty-seven cases carried the patient full term or very near term, in thirteen cases premature delivery, in three cases aborted. In two cases pregnancy interfered with by operation; in two cases myoma caused death.

Meredith reports two cases:

CASE I.—Patient aged thirty-eight. Two months' gestation. Tumor size of adult head, with thin pedicle attached to the right uterine cornu. Tumor ligatured and removed. Then Muller's ablation. Stump in lower angle of wound with Serre-nœud. Iodine to surface. Died on sixth day from double pulmonary congestion.

CASE II.—Patient aged forty-seven. Four and one-half months' gestation. Interstitial fibromyoma size of adult head, right side of uterus and lower segment. Twin pregnancy and

hydramnios. Whole mass constricted before uterus was opened. Serre-nœud extraperitoneal treatment of stump. Died on third day from septicemia.

Meyer, K.—Patient aged forty. Three months' gestation. Tumor on posterior uterine wall, broad base. Total extirpation. Recovered (?).

Miclin.—Patient aged thirty-five. (?) months' gestation. Myoma above uterine os, the size of a goose egg. On posterior wall a tumor as large as a fist. Complicated with nephritis. Myomectomy. Right ovary, in process of cystic degeneration, also removed. Stump stitched over with peritoneum and dropped. Recovered.

Mikhine reports two cases:

CASE I.—Patient aged (?). Two to three months' gestation. Uterine tumor. Supravaginal amputation. Recovered.

CASE II.—Patient aged (?). Three months' gestation. Tumor extending above the umbilicus. Profuse hemorrhage. Entire uterus removed by abdominal hysterectomy. Recovered.

Mixter, S. J.—Patient aged thirty-eight. Multiple myomata. Cesarean section and supravaginal amputation. Recovered. Living child.

Monod, Ch.—Patient aged thirty-nine. Three to four months' gestation. Beside the uterus a large fibroma reaching above the umbilicus. Another impacted in pouch of Douglas. Supravaginal amputation of uterus and tumors, then removal of cervix per abdomen. Recovered.

Montgomery, E. E., reports four cases:

CASE I.—Patient aged thirty-three years. Japanese woman. Hysterectomy. Several growths, thirteen in number, were situated in the posterior walls of the uterus that was enucleated. Both mother and child recovered.

CASE II.—Patient aged twenty-seven years. Gestation four and one-half months. Abdominal section. Myoma of the uterus five inches in diameter in the posterior wall and a second two inches in anterior. Removed by enucleation. Delivered at term. Mother and child both recovered.

CASE III.—Patient aged thirty-three years. Gestation three months. Abdominal section, revealed an elastic mass of the fundus of the uterus. The myoma occupied the greater portion of the posterior uterine wall. Enucleation, completed pregnancy Both mother and child recovered.

CASE IV.—Patient aged (?). Gestation (?). Pregnancy complicated by a fibroid in the uterus. Operation. Enucleation. Delivered at full term twenty-eight weeks after the operation. Good health.

Montprofit, A.—Patient aged (?). Pediculated myoma, impacting the pelvis. Conservative Cesarean section. Recovered. Living child.

CASE II.—Patient aged forty-two years. Three months' gestation. Very large fibroma, reaching on the right to the liver, on the left above the umbilicus. Uterus removed by abdominal hysterectomy after Doyen. No drainage. Recovered.

CASE III.—Patient aged thirty-six. Two to three months' gestation. Multiple fibroids; one very large, growing from side of uterus. The whole uterus removed by abdominal hysterectomy after Doyen. Recovered.

Moore, J. E.—Patient aged twenty-six. Five months' gestation. Multiple fibroids. Hysterectomy. Uterus amputated low down. Stump sewn across and dropped. Living fetus. Recovered.

Morison, Rutherford, reports two cases:

CASE I.—Patient aged thirty-three. Five months' gestation. A subperitoneal fibroid, the size of a large football, with a pedicle the thickness of a wrist. It was attached to the right upper cornu of the uterus. Supravaginal amputation. Extraperitoneal treatment of stump. Recovered.

CASE II.—Patient aged forty-one. Three months' gestation. Edematous myoma, the size of a large football, growing from the left cornu and left border of the uterus, which it had rotated. Supravaginal amputation. Recovered.

CASE III.—Patient aged forty-six. Three months' gestation. The uterus surrounded by a large multinodular fibroid tumor, only the anterior portion of the uterus wall being free. Abdominal myomectomy. The cervix was removed through the vagina by anteverting the stumps through an incision in the vagina anterior to the cervix. Recovered.

Mouchet.—Patient aged (?). Gestation (?). Uterine tumor. Cesarean section and total ablation of uterus. Living child. Recovered.

Moullin, J. A. M.—Patient aged twenty-six years. Gestation not stated. Uterine fibroma situated in the cervical region complicating pregnancy. Tumor removed, pregnancy continued uninterrupted.

Mundé, P. F.—Patient aged thirty-seven. Primipara. Gestation at term. Subperitoneal uterine tumor was diagnosis. Delivery with forceps. Living child, weighing seven pounds two ounces. Tumor was large intramural fibroid on the right side. Its capsule seemed to have been ruptured. Died on eighth day.

Murray, R. A.—Patient aged thirty. Rapidly growing fibroid in the anterior wall of the uterus. Attempt made to enucleate the tumor, but this not being possible, supravaginal hysterectomy was decided upon. Recovered.

Netzel, W., reports two cases of laparomyomotomy:

CASE I.—Patient aged twenty-nine. Between four and five months' gestation. Tumor removed the size of a man's head. Patient aborted ten days after the operation.

CASE II.—Patient aged thirty-nine. Five months' gestation. Operation. Tumor cystic myoma. Aborted two days post-operation, both cases recovered.

Noble, C. P., reports two cases:

CASE I.—Patient aged thirty-eight. Two months' gestation. Pedunculated edematous fibroid. Abdominal section, tumor removed. Aborted the fourth day. Recovered.

CASE II.—Patient aged thirty-seven. Two months' gestation. Large fibroid, ten by five inches. Hysteromyomectomy. Twin pregnancy. Recovered.

Ogden.—Patient aged twenty-four. (?) months' gestation. Interstitial myoma. Tumor enucleated. Aborted twelve days after operation. Recovered.

Oliver, J.—Patient aged thirty-six. Hypogastrium occupied centrally by a swelling extending from the pelvis to three inches above the pubes. Was confined on the 305th day after the cessation of the last menstruation.

Olshausen reports four cases:

CASE I.—Patient aged (?). Three months' gestation. Two large myoma with pedicles weighing 960 and 650 gm. Operation (?). Delivered at term. Manual removing of placenta.

CASE II.—Patient aged (?). Four months' gestation. Tumor of 430 g. Operation. Recovered.

CASE III.—Patient aged (?). (?) months' gestation. Tumor of 26 cm. circumference, weighing 410 gm. Operation intrapartum. Attempted application of forceps, had no success; child then perforated and extracted. Recovered.

CASE IV.—Patient aged (?). Four to five months' gestation. Tumor, the size of a man's head. Weight 2,360 gm. Operation (?). Recovered.

O'Shea, J. F.—Patient aged thirty-two. Five months' gestation. A subperitoneal fibroid, about the size of a large orange, its lower third imbedded in the uterine tissue; two inches from its base a smaller fibroid, size of walnut. An incision was made through the left rectus muscle, a circular incision through the covering of the tumor and enucleation with the handle of a scalpel followed. Recovered and delivered at term of a healthy child weighing eight pounds.

Ott, v., D.—Patient aged thirty. Gestation at term. Multiple myomata. A very large myoma growing from cervix. Cesarean section. Amputation of the uterus and both ovaries. Recovered. Living child.

Pagenstecher.—Patient aged aged (?). Two months' gestation. The whole posterior wall of corpus uteri covered with a myoma, partly subserous, partly interstitial. Supravaginal amputation. Recovered.

Pape.—Patient aged forty-two. (?) months' gestation. Subserous myoma, nearly the size of a man's head, growing from posterior wall of uterus, just beneath insertion of tubes; pedicle was flexed, due to retroflexion of uterus. Myomectomy.

Parvin, F.—CASE I.—Patient aged (?). Gestation at term. Fibroid of considerable size in the posterior uterine wall. Pregnancy completed without notable discomfort or disturbance of health. Labor not severe. Living child.

CASE II.—Patient aged twenty-seven. A fibroid tumor occupying the anterior and the right side of the uterus, which extended two inches above the umbilicus. Ergot given for three months. Great improvement. Metrorrhagia relieved and tumor diminished one-third in size. Labor set in 282 days after the last menstruation. Delivery with forceps.

Penkert.—Patient's age not stated. Gestation six months. Myoma of the gravid uterus, the size of a double fist. Total extirpation of the uterus. Result not stated.

Pernice, Plesch.—Case aged (?) and gestation (?). Subserous myoma. Weight of tumor two and one-half pounds. With a pedicle the thickness of a man's wrist. Recovered.

Pestalozza.—Patient aged (?). Gestation at term. Very large fibromyoma of lower uterine segment and posterior lip.

Cesarean section and total abdominal hysterectomy. Living child. Recovered.

Petersen, Ernst, reports two cases:

CASE I.—Patient aged forty-three. Three months' gestation. A myoma the size of two fists with pedicle, containing large vessels growing from fundus uteri. The uterus itself infiltrated with numerous small nodules. Supravaginal amputation. Entraperitoneal treatment of stump. Recovered.

CASE II.—Patient aged twenty-nine. Three months' gestation. Multiple myomata. Supravaginal amputation. Entraperitoneal treatment of stump. Recovered.

Peterson, R.—Patient aged thirty-three. Four months' gestation. Large uterine fibroid. Removed. Recovered (?).

CASE II.—Patient aged (?). Five months' gestation. Interstitial fibroid, the size of a child's head, on lower uterine segment. Removed. Recovered.

CASE III.—Patient aged (?). Uterus multinodular. The lobes sprouting in all directions. Refused operation. Carried full term and had an easy normal delivery. The various lobes were lifted over the brim as labor progressed and the child passed safely through the birth-canal.

Phaenomenoff reports two cases:

CASE I.—Patient aged (?). Five months' gestation. Myoma. Myomectomy. Recovered. Carried full term.

CASE II.—Patient aged (?). Two months' gestation. Uterine myoma. Supravaginal amputation. Recovered.

Picqué.—Patient aged thirty-seven. (?) months' gestation. Uter ne fibroma. Cesarean section. Placenta previa cesarin. The fibroma was not removed. Woman recovered.

Pinard.—Patient aged (?). (?) months' gestation. Fibroma uteri Conservative Cesarean section. Recovered. Child living.

Pinto, Carlo, reports five cases:

CASE I.—Patient aged (?). Two months' pregnancy. Myomata uteri. Total abdominal hysterectomy. Placenta and decidua were changed. Atrophy of all elements. Recovered (?).

CASE II.—Patient aged forty-three. Two to four months' gestation. Multiple myomata. Total abdominal hysterectomy. Recovered (?).

CASE III.—Patient aged forty-six. Three months' gestation. Myomata uteri. Supravaginal amputation. Difference between decidua basalis covering normal uterine tissue and myoma. The latter showed atrophy of compact parts.

CASE IV.—Patient aged twenty-nine. Three months' gestation. Intraligamentous myoma on left side of cervix and of corpus, 10 x 16 cm. Total abdominal hysterectomy. Recovered (?). Extraordinary hypertrophy of decidua basalis.

CASE V.—Patient aged (?). Three to four months' gestation. On right side of lower half of uterus a myoma, the size of a newborn child's head. The whole uterine surface myomatous nodules. Total abdominal hysterectomy. Recovered (?).

Pobedinsky, Nicolai.—Patient aged thirty-five. Gestation at term. Fibromyoma, weighing 1,620 gm in right broad ligament. Conservative Cesarean section. Enucleation of tumor. Recovered. Living child.

Pollosson, A.—CASE I.—Patient aged (?). (?) months' gestation. Subperitoneal fibroid in pelvis, growing from posterior uterine wall. Cesarean section and amputation of uterus. Recovered. Living child, weighing 3 kg. 200 gm.

CASE II.—Patient aged thirty-five. Gestation at term. Subperitoneal fibroma of fundus uteri, pedunculated. Cesarean section. Extirpation of fibroma. Living child. Recovered.

CASE III.—Patient aged (?). Four months' gestation. Multiple fibroids. Metrorrhagia. Abdominal excision of the entire uterus. Recovered.

Porter, M. F., reports two cases:

CASE I.—Patient aged thirty-five. Four and one-half months' pregnant. Fibroid weighing eight and one-fourth pounds, attached by a broad pedicle to the left of the fundus. Elastic ligature round pedicle. Tumor cut off, remainder enucleated. Recovered. Pregnancy undisturbed.

CASE II.—Patient aged thirty-two. Two to three months pregnant. Largest tumor in broad ligament. Abdominal hysterectomy. Recovered.

Price, M.—Patient aged thirty-one. Three months' gestation. Large uterine fibroma, broad base. Uterus up to cervix covered with fibrous nodules. Hysterectomy. Child was dead. Recovered.

CASE II.—Patient aged thirty-three. Gestation at term. Large fibroid in the birth-canal. Porro operation. Living child. Recovered.

Price, J., reports two cases:

CASE I.—Patient aged forty. Gestation at term. Multiple fibroids studding uterus. Cesarean section and amputation of uterus. Living child. Recovered. Nursed her child.

CASE II.—Patient aged thirty-nine. Gestation at term. Multiple fibroids studding uterus. Pelvic fibroid filling birth-passage. Fibroid at fundus covered by adherent omentum and intestine. Cesarean section and amputation of uterus. Recovered.

Pryor, R.—Patient aged forty-two. Gestation at term. Myoma of cervix, the size of two fists. Cesarean section. "Rotten child." Uterus amputated just above the capsule of the fibroid in the pelvis. Died from septicemia three days after the operation.

Reamy, Th. A.—Patient aged thirty. Three months' gestation. Large uterine tumor. Supravaginal amputation, the surface of the wound and hemorrhage being too great. Intraperitoneal treatment of stump. Recovered.

Reynolds, E.—Patient aged thirty. Delivered by normal labor. At this time a fibroid tumor size of mandarin orange on the anterior face of the uterus. Pains in paroxysms. Close watching. No treatment. Fibroid rapidly diminished in size. Could not be felt six weeks later.

Ribemont-Dessaignes et Cross.—Patient aged thirty-two. Four months' gestation. Pedunculated uterine fibroma. Symptoms of torsion of pedicle. Myomectomy. Tumor weighed 510 gm. and was hard. Carried full term.

Ricketts, Edwin—Patient aged twenty-six. Five months' gestation. Fibroma of cervix. Retentio urinæ hydramnios. Porro's operation. After delivery of placenta, fundus amputated. Fetus cyanotic. Recovered.

Riss, M.—CASE I.—Patient aged twenty-four. Gestation at term. Fibroma on level with the left part of the inferior uterine segment. Version. Delivery with forceps. Healthy child, weighing 2500 gm.

CASE II.—Patient aged twenty-five. Gestation at term. Voluminous fibroma of lower uterine segment, taking in posterior part of the small pelvis. Extraction of child not difficult.

Robinson, B., reports two cases of Cesarean section with hysterectomy in the pregnant uterus:

CASE I.—Patient aged forty-four years. Gestation full term. Abdominal section. Mother and child recovered.

CASE II.—Patient aged thirty-four years. Gestation three and one-half months. Tumor an enormous multinodular myoma. Cesarean section. Hysterectomy. Mother recovered.

Robson, Mayo.—Patient aged (?). Gestation at term. Uterine myomata. Cesarean section and supravaginal amputation of the uterus. Recovered. Living child.

Rosennasser, M., reports three cases:

CASE I.—Patient aged forty-one. Five and one-half months' gestation. Multinodular fibroid of uterus, consisting of six large interstitial and two subperitoneal nodules, the latter attached to the uterus by broad pedicles. Weight of tumor, exclusive of amniotic fluid, twelve pounds. Supravaginal amputation. Stump secured by Serre-nœud. Died fifty-two hours after from sepsis.

CASE II.—Patient aged thirty-seven. Four months' gestation. Tumor somewhat edematous, in lower segment of the uterus and cervix. Small spiculæ of lime salts between capsule and tumor. Pregnancy in the upper part of the uterus. Delivered through an incision, three inches beyond the umbilicus. Uterus amputated according to Baer's method. Recovered.

CASE III.—Patient, aged twenty-eight years. Gestation at term. Cesarean operation. Tumor superitoneal myofibroma, situated in the lower right segment of the uterus, occupying the posterior wall. There were several small intramural and subperitoneal fibroids scattered in the body of the uterus. Mother and child both recovered.

Rosner.—Patient aged (?). (?) months' gestation. Aborted. Pregnancy not diagnosed before operation. Recovered.

Rosenstein.—Patient aged thirty-six years. Gestation about three months. Laparotomy. Myoma the size of a child's head. The fetus came away with severe hemorrhage. Patient recovered.

Ross, James, F. W., reports three cases:

CASE I.—Patient aged (?). A large fibroid growing from the cervix into the folds of the broad ligament. Conservative Cesarean section. Decomposed fetus and placenta removed. Tumor could not be excised. Recovered.

CASE II.—Patient aged thirty-nine. Four and one-half to five months' gestation. A thirty-five-pound myoma, growing by a pedicle, about six inches in diameter, from the upper posterior surface of the left broad ligament. Fetus macerated. Supravaginal amputation. Recovered.

CASE III.—Patient aged forty. Four and one-half months' gestation. Uterus studded with myomatous nodules. After

removal of a myoma on fundus, the whole uterus was cut away. Patient died on thirty-ninth day of ileus.

Rosthorn, V., reports two cases:

CASE I.—Patient aged thirty-nine. Three months' gestation. Multiple intramural myomata, and on posterior wall of collum a myoma weighing 3 kg. Enucleation and amputation. Recovered.

CASE II.—Patient aged forty-one. Four months' gestation. Soft, elastic, subserous pseudofluctuant myoma, weighing 4,020 g Size more than a man's head, firmly attached to corpus uteri. Supravaginal amputation. Recovered.

Routh, Armand.—CASE I.—Patient aged (?). Gestation at term. Just above the lower segment of the uterus two opposing fibroids, weighing five pounds and twelve ounces. Porro-Cesarean operation. Living child. Recovered.

CASE II.—Patient aged thirty-three. Primigravida. Gestation at term. Most of the true pelvis occupied by a large impacted fibroid. Cesarean section, uterus removed below the lowest fibroid. Retroperitoneal treatment of stump. One ovary left *in situ*. Uterus was twisted. Recovered.

CASE III.—Patient aged thirty-four. Primigravida. Gestation ten days before term. Whole of the saral hollow occupied by large nodular masses. Cesarean section and uterus removed. Retrouterine tumor was firmly adherent to pelvic floor by vascular adhesions. Healthy child. Mother recovered.

Routier, M., reports five cases:

CASE I.—Patient aged thirty-seven. Three months' gestation. Uterine fibroma. Weight 2,415 gm. Myomectomy. Recovered.

CASE II.—Patient aged (?). Four months' gestation. Fibroma of 2,500 gm., between uterus and diaphragm. Hysterectomy. Recovered.

CASE III.—Patient aged (?). Three months' gestation. Voluminous fibroma Continuous hemorrhage. Total abdominal hysterectomy. Recovered.

CASE IV.—Patient aged thirty-five. Two months' gestation. Fibroma reaching the umbilicus. Very painful. Weighing 2,900 g. Total abdominal hysterectomy. Fetus of 7 cm. Recovered.

CASE V.—Patient aged twenty-six. Six months' gestation. Uterine fibroma, weighing 3350 g. Twisted pedicle. Myomectomy. On fifth day delivered of a living child. Patient died two hours later from embolus.

Rudaux, P.—Patient aged twenty-eight. Six months' gestation. Fibroma growing from anterior uterine wall. Cesarean section and abdominal hysterectomy. Living child. Recovered.

Salin, M., reports two cases:

CASE I.—Patient aged (?). Gestation at term. Pedunculated retrouterine myoma with adhesions to pelvic peritoneum. Conservative Cesarean section and tumor removed. Living child. Recovered.

CASE II.—Patient aged twenty-nine. Two to three months' gestation. Uterine myoma. Supravaginal amputation. Fetus dead. Recovered.

Samuel, F. W—Patient aged thirty. Gestation eight months and a few days. Tumor situated in and blocking the bony pelvis. Porro-Cesarean section. Living child. Recovered.

Sænger reports two cases:

CASE I.—Patient aged thirty-six. Gestation at term. Myoma the size of almost two men's heads, grown into anterior and right lateral uterine wall. Cesarean section and Porro operation. Intraperitoneal treatment of stump without elastic ligature. Weight of uterus plus myoma 2,770 gm. Recovered. Living child.

CASE II.—Patient aged thirty-two. Gestation at term. Myoma, the size of a child's head, on lower uterine segment, corpus uteri had many smaller myomata. Typical Porro operation with extraperitoneal treatment of stump. Recovered. Living child.

Sænger, Donat.—Patient aged thirty-four. Gestation at term. Myoma of lower uterine segment and the whole uterus infiltrated with myomata. Cesarean section and amputation of uterus. Intraperitoneal treatment of stump. Recovered. Living child.

Savage.—Patient aged twenty-five. Four months' gestation. Tumor occupying right side of uterus and reaching up to umbilicus. Supravaginal amputation. Recovered.

Schauta-Hacker reports three cases:

CASE I.—Patient aged (?). Three months' gestation. Fibroma, the size of a man's head, on fundus. Broad base. Numerous smaller fibroids. Removal of the entire uterus through the abdomen. Subperitoneal drainage toward the vagina. Recovered.

CASE II.—Patient aged (?). Five months' gestation. Large fibroid and ovarian dermoid on right side. Abdominal excision of the entire uterus. Subperitoneal drainage. Died on fifth day from paralysis vagus.

CASE III.—Patient aged (?). Five to six months' gestation. Three large fibromata. Abdominal excisions of the entire uterus. Subperitoneal drainage. Secondary laparotomy in the afternoon necessitated by secondary hemorrhage from upper left stump. Recovered.

Schoreng, A.—Patient aged (?). Six months' gestation. Myoma. Weight seventeen pounds, with numerous omental adhesions. Operation (?). Recovered.

Schröder, c ted by Hofmeier:

CASE I.—Patient aged forty-four. Myoma of cervix and multiple myomata. Cesarean section and supravaginal amputation. Recovered. Living child.

CASE II.—Patient aged (?). (?) months' gestation. Multiple fibromata, one of which a large interstitial fibroid in fundus. Regressive changes in tumors. The entire uterus removed by abdominal hysterectomy. Recovered.

Sehülein.—Patient aged thirty-five. Three months' gestation. Cystic fibroid, the size of a man's head. Its posterior wall firmly connected with intestines. Enucleation. Recovered. Delivered of twins at term.

Schultz.—Patient aged (?). Four months' gestation. Myoma, size of child's head, with pedicle, attached to anterior wall of uterus. Laparotomy. Two interstitial tumors, size of nuts, were not removed. Recovered and was delivered at term. Involution of uterus normal.

Schwartz, Ed.—Patient aged thirty-five. Four to five months' gestation; multiple fibromata uteri; on fundus two large subperitoneal fibromata. Abdominal hysterectomy. Recovered.

Schwartz, H, reports two cases:

CASE I.—Patient aged thirty-four. Gestation at term. Tumor attached to left side of uterus by a broad basis. Craniotomy. Died.

CASE II.—Patient aged thirty. Gestation at term. Tumor in Douglas culdesac, with broad adhesions, long pedicle, larger than fetal head. Cesarean section and enucleation. Living child. Recovered.

Selhorst.—Patient aged (?). Nine months' gestation. Location and character of tumor (?). Uterus retroflexed. Operation. Recovered.

Seeligmann.—Patient aged (?). Three months' gestation. Uterine myomata, had grown rapidly during pregnancy, causing compression. Supravaginal amputation after method of Chrobak-Tweifel. Recovered.

Semb, O.—Patient aged aged thirty-six. Gestation at term. Intramural and subserous myomata of fundus. Cesarean section and total extirpation. Recovered.

Senn, N.—Patient aged thirty-five. Three months' gestation. Multiple myofibroma. The entire uterus removed through the abdomen by the extraperitoneal method. Case complicated by a thrombophlebites of a mild character. Recovered.

Smith, C. N.—Patient aged twenty-seven. Five to six months' gestation. Uterine tumor, lower portion hard. From two-thirds of its upper surface sprang a soft, fluctuating tumor, into which both Fallopian tubes opened. Total hysterectomy. Recovered.

Smyly, W. J.—Patient aged forty. Nine months' gestation. A tumor as large as a fetal head occupied Douglas's pouch, uterus infested with nodules. Passage of child impossible. Cesarean section. Living child. Removal of tumor difficult owing to firm adhesions and extensive extraperitoneal development Tumor and uterus removed. The stump was extirpated per vagina. Recovered.

Solwieff, G. A.—Patient aged (?). Six months' gestation. Laparotomy. Fibromata tumor. Operation. Delivery at term. Recovered.

Spencer, H. R., reports three cases:

Case I.—Patient aged twenty-eight. Gestation at term. Fibroids in the lower segment. Porro's operation. The uterus removed weighed six pounds. Living child. Recovered. Sexual passion lost for fourteen months after the operation and then reappeared.

Case II.—Patient aged twenty-one. Large sacral enchondroma, obstructing labor. Porro's operation. Died on the ninth day of uremia. Child recovered.

Case III.—Patient aged forty-one. Gestation at term. Fibromyoma, myxomatous degeneration, distending the left broad ligament. Abdominal section, tumor removed. Eight and a half hours afterwards a dead child was born.

Spinelli.—Patient aged (?). Four months' gestation. Myoma of anterior uterine wall, growing into the ligament, weighing 3 kg. Aborted four days after operation. New pregnancy two months later.

Stavely, Albert L., reports two cases:

CASE I.—Patient aged twenty-five. Two and one-half months' gestation. A firm sessile myoma directly behind the abdominal wall and situated on the posterior and right side of the fundus, about the size of an orange. Enucleated. Recovered. Delivered at term of a healthy child.

CASE II.—Patient aged thirty-five. (?) months' gestation. Myoma, situated at the right cornu, about 8 cm in diameter, of firm consistence. Removed by enucleation. Delivered at term of a living child.

Stavely, A. L., reports two cases.

CASE I.—Patient aged twenty-five. Two and one-half months' gestation. A firm sessile myoma directly behind the abdominal wall on the posterior and right side of the fundus. Removed by enucleation. Recovered. Delivered at term of a healthy child.

CASE II.—Patient aged thirty-five. Three months' gestation. A myoma situated at the right cornu uteri, about 8 cm. in diameter, of firm consistence. Removed by enucleation. Uncomplicated recovery. Delivered at term of a living child.

Steinthal.—Patient aged thirty-four. Gestation at term. Subserous myoma. Springing from posterior uterine walls, broad pedicle. Cesarean section and removal of uterus and tumor. Recovered. Extraperitoneal treatment of stump. Living child.

Stewart, J.—Patient aged thirty-five. Six months' gestation. Subperitoneal, sessile growth attached to the left of fundus uteri. Deeply imbedded in the wall of the uterus. Myomectomy enucleation. Recovered. Delivered of a boy at full term.

Stone, I. S.—Patient aged forty-four years, dark negress. Hysterectomy for fibromyoma. The uterus was exhibited wherein the fetus membranes were in position showing about three months' gestation. Recovered.

Strasz, C. H.—Patient aged thirty-two. Five weeks' gestation. Uterus in retroflexion. Myomectomy. Tumor weighed 3 kg. Carried full term.

Strauch, M. V.—Patient aged twenty-eight. Four months' gestation. Subserous fibromyoma with short pedicle springing from cornu uteri, measuring 12 x 3 x 7.5 cm. Laparotomy.

Recovered Further pregnancy normal. Was delivered of a healthy girl at term.

Stravinsky, M. N. J.—Patient aged (?). Seven months' gestation. Fibromyoma, size 18 x 18 x 9 cm. Partus premature Enucleation eleven days after partus. Recovered.

Sutton, S. R.—Patient aged (?). Five months' pregnant. A degenerated fibroma, weighing twenty-two pounds. Supravaginal amputation. The child died. Patient recovered.

Tarnier.—Patient aged (?). (?) months' gestation. Large myoma filling the pelvis. Conservative Cesarean section. Child died shortly before operation. Woman died six days after operation from an embolus. No infection.

Tassier.—Patient aged (?). Six weeks' gestation. Three fibromyomata, size of child's head. Corpus uteri imbedded in fibromyomatous mass. Laparotomy and amputation of uterus. Recovered.

Tauffer.—Patient aged twenty-seven. Four to five months' gestation. Cervical fibromyoma. Supravaginal amputation. Recovered.

Taylor, W. J.—Patient aged thirty. Four months' gestation. A large myoma from the right broad ligament and two smaller subperitoneal myomata from the posterior and upper surface of the uterus, weighing in all three pounds fourteen ounces. Incision through the upper layer of the broad ligament and through the capsule of the tumor. Enucleation of the three tumors. Several small bodies dotted over the surface of the uterus were not removed. On sixth day from the date of operation a fetus of four months with its membrane and placenta was removed. On the eighth day she was delivered spontaneously of another and second fetus which lived for one hour. Slow recovery.

Tedenat reports two cases. Age (?) Gestation (?). Uterine tumor. Entire uterus removed by abdominal hysterectomy. Recovered.

Thompson.—Patient aged (?). Two months' gestation. Subperitoneal fibroma, the size of child's head. Operation. Five months later. Delivered of a dead child in seventh month of gestation during an acute attack of gastrointestinal catarrh. Prolapse of umbilical cord. Recovered.

Thompson, F. D.—Patient aged thirty-three. Four and one-half months' gestation. Tumor extending from the cervix to two inches above the umbilicus. Hysterectomy. Recovered.

Thorn, W., reports eight cases:

CASE I.—Patient aged thirty-eight. Three months' gestation. From right wall a hard tumor, the size of a fist, developing intraligamentous. Hyperemesis. Artificial abortion on account of hyperemesis. Recovered. Involution of tumor to half its size.

CASE II.—Patient aged thirty-six. Gestation at term. In right and anterior uterine wall a myoma, the size of nearly a head. At end of pregnancy patient can only sleep in sitting posture. Delivered with forceps, living child. Involution of tumor to half its size. Developed again to former size.

CASE III.—Patient aged thirty-six. Three and one-half months' gestation. Myomata uteri. Sanguineous discharge. Hemorrhage cured by rest and extr. viburn., prunifol, etc. Delivery at term. Normal puerperium.

CASE IV.—Patient aged thirty-six. Subserous intramural myoma of posterior wall, the size of a fist. Partus at term. Forceps. Living child. Myoma grown smaller. Recovered.

CASE V.—Patient aged twenty-seven. Intramural myoma of right wall, the size of a fist. In ninth week severe abdominal pain, central necrosis of myoma was thought of. These symptoms disappeared after rest in bed. Opiates, etc. Partus at term.

CASE VI.—Patient aged twenty-seven. Four months' gestation. In anterior uterine wall a tumor bluish-red, size of a small fist. This and two smaller myomata were enucleated. Recovered. Partus at term.

CASE VII.—Patient aged forty-two. (?) months' gestation. On left cornu and anterior uterine wall a firm tumor. Uterus had rotated nine degrees to the right. Enucleation of two myomata. Castration. Recovered.

CASE VIII.—Patient aged forty-one. Three months' gestation. Uterus rotated nine degrees to the right. Two large myomata, one on posterior wall, another on fundus. Enucleation. Four weeks before term spontaneous delivery. Recovered.

Thorn.—Patient aged forty-one. Three months' gestation. Subserous intramural myoma. Springing from anterior uterine wall a myoma the size of a plum in fundus uteri. Enucleation. Recovered.

Thornton, J. K.—Patient aged thirty-nine. Seven to eight months' gestation. Large tumor attached to uterine walls with intestinal adhesions. Uterine wall full of small fibroids in all

stages of degeneration. Tumor removed by opening the abdomen. Died on fifth day from obstruction of intestine.

Toth reports three cases:

CASE I.—Patient aged thirty-six. Multipara. Three to four months' pregnancy. Uterus contains several fibrous nodules, both subserous and interstitial; in culdesac of Douglas a pedunculated fibroma. Cystic degenerated, necrobiotic. Laparotomy. Uterus extirpated. Recovered.

CASE II.—Patient aged thirty-two. Multipara. Three months' gestation. On posterior uterine wall an interstial fibroma, the size of a fist, impacting the pelvis. Hysterectomy after Chrobak. Recovered.

CASE III.—Patient aged twenty. Multipara. Two months' gestation. A soft interstitial myoma, growing from cervix, filling the entire pelvis. Hysterectomy. Retroperitoneal treatment of stump. Recovery.

Thring, E. T., reports seven cases of myomectomy during pregnancy.

CASE I.—Patient aged twenty-nine years. Gestation not stated. An incision of the outer border of the right rectus over the tumor was made. Revealed a pedunculated uterine fibroid attached to the right anterior part of the fundus by one-inch pedicle. Delivery at term. Both mother and child recovered.

CASE II.—Patient aged thirty-nine years. Gestation not stated. Operation. Middle line section a fibroma attached to the lower segment of the uterine body, wedged in the pelvis. Enucleation. Patient delivered at term. Child and mother living.

CASE III.—Patient aged twenty-four years. Gestation about three and one-half months. Operation, incision through the inner margin of the right rectus sheath. A large fibroid on the right side of the broad ligament. Attached the right posterior part of the cervix uteri was removed. Pregnancy continued normal, labor at term. Recovered.

CASE IV.—Patient aged forty years. Gestation six and one-half months. Operation. Abdominal incision revealed tumor, a fibroid myoma of the surface of the uterus. Aborted thirty-six hours after the operation. Patient recovered.

CASE V.—Patient aged thirty-four years. Gestation not stated. Operation. Incision through the right rectus sheath. Fibroma of the uterus filling the pelvis. Enucleation of the tumor. No abortion. Patient recovered.

CASE VI.—Patient aged thirty-eight years. Multipara. Gestation between six and seven months. Operation. Middle line incision. Tumor connected with the fundus uteri which was enucleated. Delivered at full time. Mother and child living.

CASE VII.—Patient aged thirty-two years. Five months' gestation. Operation in the middle line. Tumor a large fibromyoma growing from the undus uteri undergoing degeneration. The mass was removed through an elliptical incision. It is believed that pregnancy will go at full term.

Thumim, L., reports three cases:

CASE I.—Patient aged thirty. Three months' gestation. Subserous myoma with pedicle attached to fundus. Myomectomy. In spite of complications by nephritis and cystitis, no disturbances in pregnancy. Recovered.

CASE II.—Patient aged thirty-five. Two to three months' gestation. Subserous myoma on fundus, size of fist. Broad base. Enucleated. Carried full term. Recovered.

CASE III.—Patient aged twenty-eight. Five to six months' gestation. On anterior wall uteri to the left a sessile myoma, size of fist, on fundus another, size of walnut. Enucleation. Carried full term. Living child.

Tissier, M. L.—Patient aged thirty-eight. Gestation at term. Multiple fibromata, weighing together 2,180 gm. Cesarean section, followed by hysterectomy. Living child. Recovered.

Tolotschinoff-Twanoff.—Patient aged (?). Gestation at term. Large retrocervical fibroma. Cesarean section and supravaginal amputation of the uterus. Extraperitoneal treatment of stump. Recovered. Living child.

Torngren.—Patient aged (?). (?) months' gestation. Location and character of tumor (?). Operation (?). Recovered.

Treub, H., reports three cases:

CASE I.—Patient aged twenty-nine. Seven weeks' gestation. Subserous intraligamentous myoma, no pedicle. Laparotomy. Further gestation normal. Delivery three weeks before term. A healthy child.

CASE II.—Patient aged thirty-six. Five weeks' gestation. Fibromyoma, size of two fists. Laparotomy. Further pregnancy normal. Six weeks before term delivered of a child weighing two kilogrammes.

CASE III.—Patient aged thirty-five. At the end of six months gestation was delivered of two dead children, then a large fibroma

on posterior lip of collum uteri was removed. Woman died five hours after operation.

Tull, E. E., reports two cases:

CASE I.—Patient aged twenty-nine. Six to seven months' gestation. Suppurating fibroid. Large attachment of omentum, firmly fixed to uterus. Median incision was made, tumor and uterus were brought up through the incision. Enucleation. Recovered. Delivered at term of a healthy child. Assisted with forceps.

CASE II.—Patient under thirty. Four months' gestation. Fibroid, hard, the size of a small apple in the wall of the posterior lip of the cervix. Enucleation. Delivered at term without accident.

Tuttle, A. H., reports two cases of pregnancy complicated with uterine myomata.

CASE I.—Age not stated. Four months' gestation. Exploratory incision revealed a diffuse myomatous condition of the posterior wall of the uterus. The tumor was removed. Delivery at term, both mother and child recovered.

CASE II —Patient's age not stated. Gestation between four and five months. Uterine myomata on the anterior surface removed without disturbing the uterus. Delivered at term. Mother and child both recovered.

Ullman, C. M —Patient aged thirty-nine. Multiple subserous myomata and retroperitoneal ovarian tumor. Porro operation. Amputation of uterus. Died sixty-one days after operation from ileus. Living child.

Unterberger.—CASE I.—Patient aged thirty-three. Two months' gestation. Interstitial myoma, developed from left side of uterus. Supravaginal amputation.

CASE II.—Patient aged (?). (?) months' gestation. Supravaginal amputation. Recovered (?).

Valenta, V., reports four cases:

CASE I.—Patient aged thirty-nine. Five months' gestation. On fundus uteri a myoma, the size of a man's head; on right side of uterus a tumor the size of an apple. Uterus extirpated by laparotomy, securing of stumps behind the united peritoneal flaps. Weight of tumor 1,800 g. Recovered.

CASE II.—Patient aged thirty-four. Three months' gestation. Multiple myomata, cystic degeneration, the largest in culdesac of Douglas. Supravaginal amputation. Retroperitoneal treatment of stump. Recovered.

CASE III.—Patient aged forty. Six months' gestation. Between vagina and rectum a myoma the size of a fist, with capsula. Cesarean section after Porro. Died fifty-two hours after from sepsis.

CASE IV.—Patient aged thirty-nine. Four months' gestation. Myoma with broad pedicle on posterior wall, larger than a fist. Enucleated by laparotomy. Died forty hours after from sepsis.

Vance, J.—Patient aged forty-two. Five to six months' gestation. An enormous fibroid with numerous nodules adherent to the transverse colon. Tumor removed by myomectomy. Cut open; it contained a fetus with the cord wrapped about the neck. Tumor weighed 205 pounds. Recovered.

Van Hasselt.—Patient aged (?). Three months' gestation. Myoma the size of a fist, extraperitoneal development. Operation. Recovered.

Varnier, H.-Delbet, T.—Patient aged thirty-two. Intrapartum. Uterus completely retroflexed, caused by a subperitoneal sessile fibroma on fundus. Cesarean section and abdominal excision of uterus. Child had been dead for some time. Recovered.

Varnier, H.—CASE I.—Patient aged thirty-three. Gestation at term. Interstitial fibroma of uterus, the size of a fetal head, pseudofluctuant, not isolated from uterine mass. Cesarean operation and hysterectomy. Died two and a half hours after operation.

CASE II.—Patient aged twenty-six. Gestation at term. Intraligamentous fibroma, the size of an apple. Cesarean section and Porro operation. Living child, weighing 3,630 g. Recovered.

CASE III.—Patient aged forty-three. Gestation (?). Voluminous interstitial fibroma. Twin pregnancy. Premature labor. Died during extracting second child. Living children.

Vantrin-Schuhl.—Patient aged forty-three. Eight months' gestation. Subperitoneal myoma on fundus. Two interstitial myomata of lower uterine segment. Hemorrhage, prolapse of umbilical cord. Seven hours after death of fetus. Removal of entire uterus by abdominal hysterectomy. During reconvalescence phlebitis and edema of left leg.

Vantrin, M., reports two cases:

CASE I.—Patient aged (?). (?) months' gestation. Fibroma in front of uterus, behind pubis. Myomectomy. Recovered.

Case II.—Patient aged thirty-three. Four months' gestation. Fibroma. Supravaginal amputation. Extraperitoneal treatment of stump. Died three days after operation from peritonitis.

Vineberg, H.—Patient aged thirty-four. Three months' gestation. Fibroma of cervix. Subvaginal hysterectomy. Recovered.

Vogel.—Patient aged thirty-six. Two months' gestation. Multiple fibroids impacted in small pelvis. Panhysteromyectomy. Stumps and vagina covered over with peritoneum.

Voron.—Patient aged (?). Six months' gestation. Fibroma making extraction of fetus difficult. Laparotomy. Patient died from asphyxia during anesthesia, caused by vomiting tea and champagne taken shortly before.

Wagner, Carl.—Patient aged thirty-six. Had given birth to nine children and aborted six times. Intrapartum. Fibroma of the cervix blocking the whole pelvic cavity. Extirpation of the uterus with everything *in situ*. Child dead, placenta macerated, liquor amnii. Decomposed. Recovered.

Wahl.—Patient aged forty-two. Six months' gestation. Subserous, interstitial myoma covering a large part of anterior uterine wall. Laparotomy and Porro operation. Recovered.

Wallace, A. J.—Patient aged thirty eight. Two months' gestation. One calcified fibromyoma with numerous bands of adhesions connecting the tumor to the pelvis. Sacrum and vermiform appendix, no connection with uterus. Two subperitoneal myofibromata were attached to the anterior wall of the uterus by a common pedicle two inches wide by half an inch in thickness Two more interstitial myofibromata were growing in its walls. The larger tumor was freed from its adhesions and drawn out of abdomen. The pedicle of the smaller tumors was tightly clamped, ligatured in three sections between clamp and tumors and the latter cut off. Recovered.

Walter, W.—Patient aged forty-two years. Gestation not stated. Supravaginal hysterectomy. Tumor the size of a melon occupying the front of the left and the right uterine walls. Result not stated.

Walzer, F.—Patient aged thirty-five. (?) months' gestation. Uterus infiltrated with many large and small myomata. Large myoma in anterior wall behind symphysis, just above internal os. Another large tumor grew from posterior wall into the uterine cavity. Patient aborted at three months' pregnancy. A month later supravaginal amputation. Recovered.

Warnek Kordi, reports two cases:

CASE I.—Patient aged (?). Gestation three months. Subserous myoma. Operation. Recovered.

CASE II.—Patient aged (?). Gestation five months. Character and location of tumor (?). Operation. Recovered.

Webster, J. C.—Patient aged thirty-one. Four and one-half months' gestation. Large fibroid developing from the cervix, extending extraperitoneally into the right broad ligament. Myomectomy, removing the large tumor. Next uterus emptied, incised through the myomectomy wound. Fetus slightly macerated. Recovered.

Werth, Bracht.—Patient aged (?). Gestation at term. Intraligamentous myoma of cervix and several smaller tumors. Conservative Cesarean section and enucleation. Recovered. Child living.

Winkel reports three cases:

CASE I.—Patient aged (?). Three months' gestation. Uterine tumor. Supravaginal amputation. Recovered.

CASE II.—Patient aged (?). Four months' gestation. Uterine myoma. Supravaginal amputation. Recovered.

CASE III.—Patient aged (?). Five months' gestation. Uterine myoma. Supravaginal amputation. Recovered.

Winkel, Wittich.—Patient aged (?). Gestation at term. Multiple fibromata. Cesarean section and supravaginal amputation. Living child. Recovered.

Wood W. C.—Patient aged thirty. Gestation at term. Large fibroid filling up the pelvis. Uterus lay above and behind it. Porro operation. Uterus then opened. Living child. Died at the end of fifty-two hours from postoperation. Pneumonia.

Wyder.—Patient aged forty-one. (?) months' gestation. In right anterior uterine wall an interstitial myoma nearly the size of a child's head. Laparotomy. Enucleation. Recovered. Delivered at term.

Yarrows, R. S.—Patient aged thirty-five years. Gestation six months. Tumor from the posterior wall of the lower uterine segment. Abdominal section. Myomectomy. Fibroid tumor weighing twelve pounds. Uterus and fetus weighing seven pounds. Patient died from shock.

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FIBROID TUMOR OF THE UTERUS SIMULATING PREGNANCY.

BY

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It is unusual for a patient who has been the subject of a fibroid tumor for three or four years to suddenly cease menstruating and within a few weeks thereafter develop all the usual symptoms of pregnancy when pregnancy does not exist. A short clinical report of such a case will be of interest.

The patient, Mrs. P., was thirty-seven years of age; married fifteen years; had had no children and no miscarriages. She had been conscious of some pelvic disease for about four years. Her attention was first directed to her present ailment by a discomfort in her back at her menstrual periods which were prolonged a day over the usual time, which was three days. After a year or so she noticed that the periods, came two or three days earlier and lasted for a day or two longer, with a greater flow at each period. Early in 1907 she first observed a small lump above the pubes near the middle line of the abdomen. After this she consulted her physician and he informed her that she had a fibroid tumor of the uterus which practically filled the pelvic cavity, but as she was not suffering much and the loss of blood was not excessive he did not urge an immediate operation.

She did not notice any increase in the size of her tumor or any inconvenience until early in March, 1908. Her last menstrual period was February fifth to eleventh, but she says that the flow was very scant—only a little flow the first day and each succeeding day just enough to stain the linen—while formerly for more than a year the flow had been excessive. Three weeks later, March second, she had a stain on the napkin as large as a silver half-dollar. Two days before this date she had morning sickness and vomited. She had observed for more than two weeks that her breasts were enlarged somewhat and she suspected that she was pregnant.

After March second, she had morning sickness every two or three days until the twentieth. After that date she had morn-

ing sickness almost every day, and occasionally she would be sick at her stomach in the evening as well. She was a small, lean woman, normally weighing about one hundred pounds and a brunette. She and her husband were exceedingly anxious to raise children.

She was examined by two good practitioners of medicine before she came to me and they both believed that she was pregnant in the upper half of a fibroid uterus. When she consulted me the breasts were firm and she said one-third larger than normal. The areola around the nipple was very dark, the nipples were much larger than normal, and by the least effort one could squeeze secretion from them. She was not alarmed at her condition and only sought my advice at the suggestion of her physician, because he informed her that if the pregnancy was permitted to go on, she could not be delivered without a surgical operation. She felt as well as usual excepting the morning sickness before described.

Upon physical examination it was found that she had a multinodular fibroid of the uterus just filling the pelvic cavity. Above this and extending somewhat to the patient's left side was a second tumor a little larger than the first; the latter being soft and elastic and feeling very much like a pregnant uterus. The entire lower half of the tumor including the cervix appeared hard as a fibroid tumor should. The whole upper half was as above described. I had little hesitation in pronouncing her pregnant in the upper segment of the fibroid uterus, the lower portion of which could not be lifted out of the pelvic cavity. I advised an immediate hysterectomy. She went to the hospital April 27, 1908, and was operated the thirtieth.

When the abdomen was opened, there were no adhesions to the tumor. The lower half of the tumor developed partly beneath the folds of the right broad ligament, which accounted for the inability to lift the tumor up. The upper half had the appearance of a pregnant uterus. I proceeded with the operation of hysterectomy, believing that she was pregnant, and was not able to correct the diagnosis until after I cut into the tumor. The supposed pregnant part had for some reason recently grown very rapidly, and was soft and much darker in color than the remaining part of the tumor, which was the usual multinodular fibroid of the uterus.

In commenting upon this case, one is reminded how exceedingly difficult it is to make a diagnosis of pregnancy before the

heart sounds of the fetus can be heard. Again, we are forcibly reminded that all signs of pregnancy, excepting the one just mentioned, may be simulated so perfectly that the most expert diagnostician may err. In the case just narrated, if we were certain that the patient was not pregnant, we would have advised operation regardless of that fact, because the tumor was so situated in the pelvis and of such a size that it greatly interfered with the functions of the bladder and rectum as well as from the pressure which caused much pain in the limbs in locomation.

In addition to these facts, the long standing of the tumor with the rapid increase in size urged the necessity of early interference. The writer only puts the case on record to illustrate how difficult and, sometimes, impossible it is to make a diagnosis of pregnancy before the fetal heart sounds can be heard.

ABDOMINAL SURGERY IN THE AGED.

BY

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THE most impo-tant advance in abdominal surgery within recent years is the recognition of the fact that operations should be performed without needless waste of time, with a minimum amount of traumatism and careful preservation of the patient's resistance. These facts have been presented very clearly to the profession by John B. Murphy and Robert T. Morris, members of this Associat on. Careful attention to these details diminishes the mortality of surgery markedly, and is of the highest importance in the surgical treatment of patients suffering from intra-abdominal lesions. In aged patients especially is it important for the surgeon to conserve all the recuperative powers of his patient to the highest degree. One of the chief risks in operations upon this class of patients lies in the anesthetic. The recent advances in the use of local anesthesia have proven beyond a doubt that many conditions which were formerly subjected to operation under a general anesthetic can be very successfully handled by means of local anesthesia. It is to call especial attention to this one point that we have been led to report the following cases:

CASE I.—Mrs. A. N.; white, aged sixty-six. Has been treated by her attendant, Dr. Solomon, for some months for cardiac insufficiency, arteriocapillary fibrosis and Bright's disease, with an intermittent albuminuria; she also has frequent attacks of asthma. Under his treatment she has shown some improvement, but now has a very severe cough, which on last evening caused a knuckle of intestine to protrude into the sac of an old irreducible omental umbilical hernia. This hernia I found to be strangulated, and the patient's condition being such that a general anesthetic could not be safely administered, we decided to attempt herniotomy under local cocainization. A medium-strength

Schleich solution was infiltrated into the skin over the tumor, which was the size of a man's fist. The skin was incised painlessly and the extravasated serum escaped with some force the moment the peritoneum was opened. The serum was quite bloody and readily accounted for the sense of fluctuation which had been detected before operation. A knuckle of intestine six inches long was strangulated and quite black. The color returned after about thirty minutes' treatment with hot compresses. That portion of the omentum which was strangulated was removed, the ring enlarged below and the intestine and remaining omentum replaced in the peritoneal cavity. The abdominal wall was sutured, the entire operation being concluded without the patient complaining at all of pain; even the manipulation of intestine and omentum caused no suffering whatever. She made a very nice recovery, which we believe would not have resulted had the operation been performed under a general anesthetic.

CASE II.—Mrs. E. B.; white, aged seventy-four. Was seen June 28, 1908. I found a woman in not very robust health presenting the following history: She has suffered for 25 years with a right femoral hernia which has been reducible in part. Several days ago she had a slight elevation of temperature, some straining and a pain in the right lower abdomen. Following this she noticed that the mass in her groin was considerably increased in size, and she now complains of considerable pain and discomfort in that region. She has not had a movement of the intestines for at least two days. A few minutes of very gentle taxis showed us that reduction would be impossible without surgical interference. We believed the hernia to be an incarcerated one and not yet strangulated. For this reason we deferred operation. On the following morning she passed both gas and feces and was fairly comfortable, but on July 2, she again failed to have any fecal movements and began to vomit incessantly.

Considering her general condition and her repugnance to an operation, we deemed it wisest to attempt the relief of the condition under local anesthesia. The operation was completed without incident and the patient suffered very little from pain. In addition to the other contents of the sac an inflamed appendix, distended with pus, was found and removed. The changes in this organ were not those that we would expect to find from strangulation, and it was evident that the appendicitis was

present before the appendix had entered the sac, the latter occurring probably early in the attack when she was suffering so much pain.

We could cite a number of cases illustrating the use of local anesthesia in grave abdominal conditions in old people and in patients very much depleted, but we believe these two cases will serve to emphasize this valuable aid to surgical technic.

EVOLUTION IN THE HISTORY AND TREATMENT OF UTERINE FIBROIDS.

BY

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I CAN hardly believe it a waste of time to review the subject that is now so important a part of our abdominal practice as that of uterine fibroids, and trust a few brief references to the history may not be uninteresting. To me it is somewhat reminiscent for, as I look back and remember the evolution, something over forty years ago, I can scarcely realize how progressive the members of our profession have been in solving a question at one time so exceedingly serious as that of the surgical treatment of these cases. Ovarian tumors were well recognized a century ago. McDowell's famous case gave us a pathology and treatment that was quite acceptable then, but this could not be said of solid tumors.

Members of our profession who now have access to the splendid work of Dr. Kelly, 1898, on "Operative Gynecology," and other similar volumes, where the history of uterine fibroids and hysteromyomectomy is spoken of, cannot grasp the slow and anxious way early surgeons were compelled to follow in acquiring knowledge that was gradually accumulating, more particularly in reference to the treatment of these tumors. The one, and most important source, was through our medical journals, and in the meetings of such associations as this and others a few years older. The discussions following the reading of a paper, and the report of some particular case, or new methods suggested, have been invaluable to the operating surgeon. The other method of acquiring facts pertaining to the subject, was that of the very latest volumes on general surgery and the work of specialists, as brought out in the books on gynecology and abdominal surgery.

I remember so well studying the reports presented in our journals by Dr. Walter Burnham, of Lowell, Mass., who, near the close of his life, presented a paper on "350 Abdominal

Operations," done at the homes of the patients, which was a most remarkable report on the courage and resources of the author and operator; however, nearly all of his work was done for ovarian tumors, or some disease of the ovaries. Dr. W. L. Atlee also published the result of his work which was most interesting and instructive.

Through all these decades of surgery, one might say from 1840 up to 1880, the subject of enucleation of uterine fibroids was very earnestly considered. The classification was much like that of the present time, that is, submucous, interstitial and subperitoneal, but in the minds of many of the authors, and in reports of cases, there was some confusion as to the recognition of uterine polypi. Later, however, the subject was cleared up, and yet these are the cases that encouraged the operators to advance in the field of surgery in the treatment of uterine fibroids, for the submucous variety would become pedunculated, when all manner of methods were suggested for their removal. I can call to mind seeing many cases which were amenable to treatment by use of the wire écraseur, Thomas's serrated scoop, or enucleation, sometimes with a blunt-pointed steel instrument attached to the finger, or, in some way, the capsule opened and the tumor shelled out after thorough dilation of the cervix, but it must be borne in mind that we did not have any such perfect method of dilatation in those days as at the present time. It was the tedious sponge tent, the Molesworth rubber dilator, or some such crude method, that enabled us to reach the cavity of the uterus. Nature often came to the rescue of the patient by the pronounced contraction of the walls of the uterus and the shutting off of the blood-supply through the tumor; then the uterus would contract vigorously to empty itself of so offensive a mass, and a gradual sloughing would take place, this often leading to sepsis and the death of the patient in consequence.

Again, I can call to mind some of the most distressing cases of this kind, where we would consider ourselves fortunate in being able to remove the mass by various kinds of forceps and to thoroughly wash out the cavity of the uterus. Like removal of the remaining portions of retained placenta numerous forceps were suggested, but nothing was ever executed safely until the days of aseptic surgery and the free use of the uterine dilator.

Dr. Atlee was among the first to advance in the operation of removing subperitoneal fibroids by abdominal section, and this was looked upon as a bold operation. Occasionally he would

operate through the vagina and during the latter years of his life he did do a hysterectomy in some cases.

Dr. Burnham gives a most interesting report of removal of a uterine fibroid in an operation he had commenced for the removal of what he had supposed to be an ovarian cyst. During the act of vomiting a fibroid tumor was extruded through the wound, when his presence of mind exhibited his surgical resources and he proceeded deliberately to ligate through the neck of the uterus, controlled the hemorrhage in this way, doing a supravaginal hysterectomy, and removing the ovaries which were diseased at the same time. This was the first case of the kind and it was reported June 26, 1853. Like all operations done at that time, and for a long period afterward, silk ligatures were withdrawn through the lower end of the wound, and gradually came away in a month, six weeks, two, three, four or even six months afterward. I have no doubt these ligatures acted exceedingly well as a drainage wick. Dr. J. C. Irish states that altogether Dr. Burnham performed fifteen hysterectomies with three recoveries.

Dr. Kimball states: "That on September 1, 1853, he did his first hysterectomy for removal of a uterine fibroid, and this was about the earliest description given of the classification of symptoms in which the operator was able to make a correct diagnosis." In the *Boston Medical and Surgical Journal*, 1855, vol. lii, p. 248, is reported "A Successful Case of Extirpation of the Uterus," by G. Kimball, M. D., Lowell, Mass.

This case was drawn to Dr. Kimball's attention by Dr. Skinner, of Vernon, Ct., who in his letter to Dr. Kimball says: "No great inconvenience attends the size of the tumor, but the trouble is from hemorrhage during the period of menstruation. Every month a large quantity of blood is lost, reducing the patient extremely, even hazarding her life. Now the question is: Can this be a suitable case for the operation of ovariotomy? Is not the uterus implicated in the disease? The tumor is movable, and, I should think, no very firm attachments have formed, but whence this profuse hemorrhage, if not from the uterus? The patient is thirty-four years old, and at the commencement of the disease was in robust health."

Dr. Kimball replied that the account given of the case was characteristic of uterine rather than ovarian disease. Even with this view in mind he was not prepared to pronounce it altogether beyond the reach of remedy. As a last resort he proposed the

removal of the uterus itself. The patient was found to be extremely weak and anemic, and was lying in bed upon her back unable to sit up or turn without help. On examination, the tumor was found to be globular, movable, and about seven inches in diameter. The neck of the uterus was found normal both in position and size. The os uteri opened rather more than usual; a sound passed up readily some four or five inches. The entire bulk of the tumor lay in the abdominal cavity. The important question was now raised whether the case was one that promised any chance of relief from a surgical operation. The operation proposed was removal of the uterus by section through the abdominal walls. Extraordinary and hazardous as this suggestion seemed, the feeling was unanimously expressed, at the consultation, that this procedure offered the only possible chance of saving the patient from impending death. The patient was now put in readiness for the operation and brought under the influence of chloroform.

Upon exposing the abdomen and observing the small size of the patient, it appeared quite evident that in order to dislodge the tumor entire it would be necessary to extend the incision from the ensiform cartilage to the pubis. But rather than do this it was thought better to expose a part only of the tumor, and see what could be done in the way of enucleating the diseased portion of it. Accordingly an incision was made four inches in length through the linea alba directly over the most prominent portion of the tumor. Another cut of less extent, through the uterine walls, exposed the fibrous mass. No hemorrhage occurring, this last incision was prolonged to correspond with that through the parietes. Through this opening a portion of the exposed mass was suddenly extruded. Some of the attachments, however, were very firm, and rendered this part of the operation rather difficult. It was finally accomplished, however, and the uterus becoming greatly diminished in bulk was readily drawn out and placed in the hands of an assistant. A straight, double-armed needle was now passed through the organ in an antero-posterior direction, as low down as the supposed point of its junction with the neck, this part being, of course, left intact as regards its relation with the vagina.

By this plan of appropriating to each lateral half the separate ligature, there was no great difficulty in avoiding any subsequent hemorrhage; a consideration which is of great impor-

tance. The remaining part of the operation was very simple and easily accomplished. It consisted of a mere amputation of the diseased structure by a single straight incision carried across from one side to the other and as near to the ligatures as was consistent with their secure attachment. The parts having now been made as clean as possible, the wound through the parieties was brought together, and its edges secured with four sutures. Adhesive strips and a compress wet with warm water and laudanum completed the dressing. The operation lasted about forty minutes. There was no alarming degree of exhaustion and the amount of blood lost did not exceed four ounces. The subsequent history of the patient is uninteresting and uneventful. Dr. Kimball received the following letter from Dr. Skinner four months after the operation: "The patient is in very good condition. She is able to walk about the house; pulse strong, appetite good, bowels free. In short, everything about her is right except what was produced by the irritation from the ligatures. These latter, however, were merely looked upon as an inconvenience and not dangerous, and since all attempts at removal were unsuccessful and very painful it was decided to leave the ligatures in place." Dr. Kimball concludes: "That as far as can be ascertained from the records of surgery this is the first operation for removal of the uterus by what is termed the hypogastric method that has been successful."

Dr. Kimball reports another interesting case in the *Boston Medical and Surgical Journal*, July, 1876, vol. xcv, p. 29, "Successful Extirpation of the Uterus." The wire écraseur was applied at a point corresponding to the external os, involving the remainder of the broad ligament and the round ligament of the left side, the upper part of the vagina and the round and broad ligaments of the right side beyond the right ovary. The wire was tightly drawn and twisted for security, and the mass removed by the knife. The écraseur was allowed to remain, and the stump was transfixed just outside of the loop of the écraseur with a curved trocar, which was arranged to give additonal security against the return of the stump into the abdominal cavity.

This operation was performed on January 5, 1876. On January 14, the patient says she feels like herself; pulse 96; écraseur and trocar quite loose. January 16, irons removed; slough from stump not yet nice. Ordered by injection a cupful of warm lard to be followed after two hours by an enema of

warm water and molasses. January 19, slough from stump found free and removed, leaving a small opening with granulating edges, and slight purulent discharge. Adhesive strap applied. January 29, convalescing rapidly. Opening in abdominal walls nearly filled with granulations. February 1, improving; has one natural defecation daily, and good sleep and appetite. February 7, has walked a few steps; opening full and commencing to glaze over. March 1, recovered."

In the *Boston Medical and Surgical Journal*, Jan., 1874, vol. xc, p. 105, Dr. Kimball reports the results of cases in which electrolysis was employed as follows: "As regards the treatment of such cases by intrauterine section as practised by Dr. Atlee, of Philadelphia, I am persuaded that this method is only justifiable when the fibroids are small and well projected into the uterine cavity. In a majority of instances, however, these fibroid growths are found to be interstitial or subperitoneal and under such circumstances the operation referred to can scarcely prove otherwise than fatal. The more severe and dangerous operation of extirpating the entire uterus is not only inexpedient, except in rare instances, but absolutely unjustifiable, nineteen-twentieths of them having proved fatal. Of the nine cases of uterine extirpation in my own practice three only have been followed by recoveries. Drugs likewise having proved failures I resolved to make trial of another remedy, which, though at present a comparatively limited application, is likely to prove later a therapeutic agent of very great value. I allude to electrolysis.

"In regard to the modus operandi of electrolysis in bringing about the diminution in size and the absolute disappearance of the fibrous growth I have, as yet, no satisfactory answer to give. Probably a shock from a powerful galvanic battery interrupts or interferes with the nutrition of the growth, as not only to arrest further development but eventually to effect its removal altogether. The apparatus consists of a battery of zinc and carbon plates of about thirteen and one-half feet of square surface, the cell made of sheet lead, covered by a rattan basket. The exciting fluid consists of a saturated solution of bichromate of potassa, acidulated with sulphuric acid. The conductors were of copper. The first electrolysis needles used were about six inches in length, about one-sixteenth inch in diameter, cylindrical, tipped with platinum, and tapered to a point like a common sewing needle. These needles at the first trial became bent and twisted

and were unsatisfactory. The next needles were made grooved and were stronger and sharper. His usual plan of treatment was as follows: The electrodes were plunged into the most prominent part of the tumor, passing through the abdominal walls on either side of the median line, from two to six inches apart, and in a downward and inward direction. No anesthetic was usually used at these trials. An unbroken galvanic current was usually maintained from five to seven minutes. Extreme prostration, some pain, chiefly pelvic, and an elevation of pulse were usual sequences. Dr. Kimball is of the opinion that this plan does surely diminish the size of the fibroid, and in one case where dyspnea and anasarca were accompanying features both of these were greatly relieved."

There is no doubt that in the study of these cases, and in their treatment, Dr. Kimball antedated other operators in the use of the transfixion pin, that is, he first developed the principles embodied in its use. Gradually the diagnosis of fibroid tumors became more certain. The classification of symptoms was made as early as 1860, nearly as clearly and correctly as at the present time, and with the advance made in the treatment of ovarian tumors the surgical profession became more and more anxious regarding methods of treatment.

As stated by many authors, applications to the inside of the uterus, by ointments and injections, and the giving of medicines internally brought about few, if any, favorable results. In the decade from 1870 to 1880 various methods were tried of injecting ergot and other preparations into the tumor, but the results were so uncertain, and the distress that not infrequently followed, such as abscesses, and an occasional death from sepsis, did not justify the adoption of this method. After Dr. Kimball reported his case of electrolysis Dr. Ephriam Cutter, of Boston, presented some interesting papers on the subject, and reported successful cases. His method was like that employed by Dr. Kimball, but it was too heroic and the profession at large was unable to adopt a method that in many ways seemed so crude. I well remember, at about 1876, with the late Dr. William H. Bailey, of Albany, making a trip to Boston to see Dr. Cutter use this treatment. When the patient was under an anesthetic one electrode was forced into the tumor, and I shuddered as I wondered as to the possibility of some portion of the intestine being injured.

I have often said, and believe, that Apostoli received a good many of his views and suggestions from the work of Drs. Kimball

and Cutter. The Apostoli method is known to many of the surgeons of the present time, and how unsuccessful it was in many ways. Previous to 1888 the suggestions made in regard to the treatment of uterine fibroids were many. For control of the hemorrhage much good did result from dilating the cervix and curetting very carefully and thoroughly. I can report many cases where this method resulted in the extrusion of the fibroid, and I have also treated cases successfully by enucleating with Thomas's serrated scoop. In 1878 I did an operation for removal of fibroids through the posterior wall of the vagina, one of large size, and after making an incision through the vagina I succeeded in enucleating and removing by means of the obstetric forceps. This was about the first case of the kind reported, but I have seldom done this kind of an operation since.

Soon after this followed the attempt to do supravaginal hysterectomy, using the wire or rope écraseur—the latter as suggested by Mr. Tait—the amputation of the tumor, together with the uterus, then using the serre-nœud of Koeberle, with the transfixion pins, drying the parts well, using the tincture of chloride of iron or the powdered subsulphate of iron, searing the parts, at times, thoroughly well with cautery irons, and a very good proportion of these cases recovered. Sometimes septic infection would take place, abscesses form, and a prolonged convalescence or death result from the complication of peritonitis, not infrequently, and obstruction. Gradually the correct technic was developed, and all efforts at extraperitoneal treatment of the stump were done away with. Baer and Kelly's method of treating the stump was a decided advance in many ways, but it gave way to the intraperitoneal method.

When some of the French surgeons, a few years ago, called our attention to morcellation I was reminded of our own work in that direction, but the hemorrhage that resulted at the time often proved fatal and the sloughing and infectious condition that was likely to result afterward proved too great an obstacle. It is not out of place for me to state that the work of Drs. Burnham, Kimball, Atlee, together with Dr. Peaslee and others, who came later upon the field of action, was somewhat personally known to me. Scanzoni, in the 1856 edition of his work, says: "In referring to the pathology a natural form of cure, spoken of by older writers, is that of the calcareous degeneration and ossification of fibrous bodies. I have seen very few such cases and I think it is quite uncommon."

In the decade from 1870 to 1880 I treated several cases of bleeding fibroids by the application of chloride of iron by means of a form of bougie introduced into the uterus, frequently causing severe pain, but no pronounced or fatal results followed. This method was successful in relieving a number of cases but, as often mentioned by the authors at that time, and later, it was sometimes most difficult to reach the cervix and enter the cavity of the uterus. It must be remembered that this was done at a time when no great effort was made at cleansing the vagina, or any particular technic employed.

Again quoting from Scanzoni, he says: "In the most of cases after once having recognized with certainty the presence of a fibrous tumor, we should pronounce an unfavorable prognosis, for experience has sufficiently demonstrated that the intense sufferings caused by this disease are not susceptible of being relieved in a permanent manner.

"If we would remain faithful to the truth, we must avow that we do not remember a single case in which, with the means indicated, such as sea baths, saline baths rich in iodine, bromine, etc., or others, we have obtained the complete cure of a fibrous body; and if in various quarters cases of fortunate cure are cited, we must, if the tumor has really disappeared, doubt the accuracy of the diagnosis as to the fibrous nature of the malady.

"Latterly, in various quarters, an operation has been proposed and executed for removing fibrous bodies from the uterus. It has been wished to remove these tumors either by the abdominal cavity, after first having performed laparotomy, or by the vagina. Experience has for a long time rejected the first of these methods for there is not a single authenticated fact admitted where the patient has survived; the second procedure does not appear to us to be justifiable, except in very rare cases, and as for ourselves we would not employ it except when the tumor going off from the vaginal portion freely projects into the vagina."

West, an author whom I used to study with great interest, and one of the earlier writers on diseases of women, in his 1861 edition says: "The fibrous tumor of the uterus (for this name seems to me to be the most appropriate among the many designations which it has received) is a growth more or less intimately connected with the uterine walls, with which its structure is almost identical. It is seldom solitary, but several tumors are usually found to be present at the same time, though one or two generally

outstrip the others in the rapidity of their development, the rate of which, as well as the nature of the symptoms, are greatly influenced by the situation which they occupy."

With reference to the size of these growths, we encounter wide differences again in this respect, instances being on record of their attaining to such dimensions as to weigh even eighty pounds, which is worth bearing in mind, as showing that in a diagnostic point of view the mere size of the tumor is not to be relied upon in discriminating between growths from the uterus and those from the ovary.

These fibrous tumors which hang by a pedicle into the uterine cavity, and which are commonly called uterine polypi, are attended by one invariable and characteristic symptom—namely, hemorrhage, menstrual disorders, uterine hemorrhage, pain, dysuria and, more rarely, difficult defecation, are the more important symptoms, though from being present in various degrees, and in varying combinations, they often leave room for much doubt as to the nature of the affection to which they are due. The influence of fibrous tumors in modifying the rate of fecundity is very remarkable, and shows itself both in diminishing the number of conceptions and also increasing the number of pregnancies which come to a premature termination.

But there are greater evils than sterility or the premature termination of pregnancy, to which patients affected with fibrous tumors of the uterus are liable. The annals of medicine are full of cases illustrating the dangerous character of this complication, which may expose the patient to one or all three of different perils. The tumor may mechanically prevent the passage of the child through the pelvis, and may thus even necessitate the performance of the Cesarean section. It may interfere with the efficient contraction of the uterus after the expulsion of the placenta, and thus expose the patient to hemorrhage which it will be very difficult to control. Or, lastly, it may interfere with the process of involution of the womb after delivery, and may either itself undergo a morbid softening and disintegration or may be the occasion, either in connection with inflammation of its own substance and that of the womb or independently of it, of peritonitis, always dangerous, too often fatal." (West gives a very good description of fibroids and their symptoms for nearly five decades.)

"*Treatment.*—If medicine, however, is so slow and confessedly so uncertain in its action upon these growths, are they, you may

inquire, beyond the reach of surgical interference? Uterine polypi are amenable to treatment. The nonpedunculated tumors, which spring from the outer surface of the uterus, are almost or altogether beyond our reach. A few cases are on record in which the abdomen has been laid open and in which the extirpation of a fibrous tumor from the outer surface of the uterus has been attempted, and even actually accomplished. In most of these cases the operation was undertaken with the impression that the tumor was ovarian, and in all instances but one, reported by Dr. Atlee, completion was followed by the patient's death. It is a proceeding to be altogether deprecated, difficult to accomplish, almost certainly fatal if concluded, surrounded by dangers which wisdom cannot foresee nor skill avert.

"It would perhaps not be right to pass quite so sweeping a condemnation on another operation which, since its first performance by M. Amussat, has had several imitators, which consists in the enucleation of fibrous tumors of the uterine walls by an incision made through the os uteri or the lower segment of the womb. The results, however, are by no means encouraging so long as we limit our inquiry to cases of enucleation of interstitial fibrous tumors of the body of the uterus, for twenty-seven operations yielded fourteen deaths, four of the latter incomplete, and a portion of the tumor left behind."

Few volumes in my storage library have been read with so much care as Sims' Uterine Surgery, at the time of its publication in 1866, and in referring to uterine fibroids he says: "Professor Channing, of Boston, claims to have cured many by internal medication; while Dr. Simpson seems to have great faith in the long-continued use of bromide of potassium. Dr. Emmet and myself have tried this and other constitutional remedies in the Woman's Hospital, and in private practice, and I am sorry to say we have not been as fortunate as the gentlemen named above. On the contrary, I have never seen the slightest effect produced on such tumors by any internal medication. Dr. Atlee, of Philadelphia, and Mr. Baker Brown, of London, have each attacked uterine fibroids surgically and in a heroic way. Dr. Atlee has had a success in enucleation which has not been equaled by any one else. He advocates a total eradication of the adventitious growth; while Mr. Baker Brown is satisfied with maiming or mutilating the tumor by what he terms a gouging process. His success has also been very great, not in curing the disease, but in curing its worst manifestation—hemorrhage. I

have not been so fortunate as they in attacking very large intrauterine fibroids. I have lost two patients in the Woman's Hospital as a consequence of operative procedures; one from an attempt at enucleation, the other from the removal of a bit of the tumor; the one in imitation of Dr. Atlee, the other in imitation of Dr. Brown."

Thomas, in his second edition on "Diseases of Women," 1866, says, under the head of "Definition and Synonyms": "This affection consists in the development of hard, resisting and generally globular masses in connection with the parenchyma of the uterus, with which they are identical in structure, except in proportion of the elements forming them. Since the true nature of these growths has been understood, they have been described under the names of fibrous tumors, uterine fibroids, fibroma, and, more recently, by Virchow and Klob, myoma.

"*Prognosis.*—The practitioner cannot be too cautious or display too much reticence in pronouncing the prognosis of uterine fibroids. There are fewer diseases in which the young physician will be led into greater error or be made to regret more decidedly an overconfident prediction. Fibrous tumors, unless of great size, rarely end fatally, however gloomy the prospect may appear when they are first discovered. And yet death from them is not so infrequent as to warrant an entirely favorable prognosis."

"Peritonitis, phlebitis and pyemia," says Dr. West, in estimating the prospects of success held out by enucleation, "the consequences of violence done to the uteri of women exhausted by large and repeated floodings, are dangers from which but few have altogether escaped; under which I fear that correct statistics will show that most have succumbed. But the great dangers attending its performance should not deter the surgeon from resort to it in suitable cases which absolutely require aid. They should merely induce him to exhaust all palliative means which should be looked upon in large tumors as a last resource.

"With reference to the propriety of the operation of gastrotomy for removal of uterine fibroids the opinion of the mass of the profession is at present determinedly adverse. And yet it is not more so than it was twenty years ago with reference to ovariotomy. Undoubtedly this operation will some day be as safe and practicable as the extirpation of the ovarian sac." Professor Storer declares that, 'the mortality of the earlier uterine extirpations was no greater than in many isolated groups of the other operation.'

"It is not venturing too much even now to say that if the fibroid be pedunculated and unattached, its removal is no more dangerous than the ordinary operation of ovariotomy. If it be completely amalgamated with the uterus, or so bound to neighboring parts that removal proves very difficult, the operation may be abandoned, the patient having, without great risk, availed herself of the only chance of cure. Even if the removal of the neoplasm involved that of the uterus and ovaries, we may still indulge in the hope of saving our patient, as the following table, arranged by Professor Storer, will prove:"

	Operations.	Deaths.
Clay,	3	2
Heath,	1	1
Burnham,	9	7
Kimball,	3	2
Parkman,	1	1
Peaslee,	1	1
Koeberle,	1	0
Baker Brown,	1	1
Wells,	1	1
Sands,	1	1
Buckingham,	1	1
Storer,	1	0
	24	18

The percentage of recoveries is one in four, or 25 per cent.

The statistics here displayed, although showing, as they do, a large mortality, would, I fear, lead one to take a more favorable view of the results than enlarging experience will warrant. Since their publication the uterus has been removed in this country with the following results:

	Operations.	Deaths.
Storer, of Boston,	4	4
Cutter, of Newark,	2	2
Wood, of Cincinnati,	1	1
Hackenberg, of Hudson,	1	1
Atlee, of Philadelphia.	1	1
Weber, of Cleveland,	1	1
	10	10

Barnes on "Diseases of Women," 1874, says: "In discussing the treatment of fibroid tumors, it is evidently desirable to keep in mind the properties and natural history of: The natural terminations furnish the most useful indications. Knowing these terminations we may often assist in bringing them about. These terminations we have seen are: 1. Absorption or atrophy. 2. Calcareous degeneration. 3. Gangrene or other form of decomposition. 4. Spontaneous expulsion.

Medicines have been given with the four following designs: 1. To promote absorption or calcification. 2. To restrain growth. 3. To restrain bleeding. 4. To promote extrusion. Simpson, Rigby and others were very positive as to the absorption of fibroids. Simpson says they are sometimes seen in fatty metamorphosis. Spencer Wells observes that no one could expect a true fibrous tumor to disappear spontaneously; but muscular tumors rapidly grow and rapidly disappear. He expresses himself as astonished to find that doubts are entertained as to the fact of their disappearance.

The effects of mechanical pressure may sometimes be obviated by lifting the tumor out of the pelvis. Or, where flatulence is extreme, and the tumor cannot be moved or extirpated, relief may be given by puncture with a fine trocar into the intestine, as was done by Dr. Kidd. In a case he relates a great escape of gas took place. A candle brought near the gas took fire, burning with a blue flame. Next day the bowels acted freely.

We have lastly to consider the means of getting rid of the tumor altogether. This embraces the discussion of the various proceedings available for promoting their expulsion; for causing their destruction and elimination by setting up inflammation or necrosis; for ablation by enucleation, avulsion, ligature, knife, scissors, écraseur, cautery; and for removing the uterus itself along with the tumors by gastrotomy.

"Pean and Urdy trace the history of gastrotomy for the removal of uterine tumors through three distinct periods. The first, which comes down to 1843, comprises those cases in which surgeons having opened the abdomen with a view to ovariotomy, finding the tumors to be uterine, shrank before the consequences of amputation of the uterus and closed the wound. In the second period, that of trials and groping, which comes down to 1863, during which ovariotomy had made great strides, several surgeons—Atlee, Heath, Charles Clay, Parkinson—finding uterine tumors where they expected ovarian, yet did not hesitate to

remove the uterus. In the third period, beginning with April, 1863, Koeberle, in the presence of a doubtful case, prepared for either ovariotomy or hysterectomy. Storer, Pean and others deliberately resorted to gastrotomy for the purpose of removing the uterus affected by tumors.

"Between September, 1869, and February, 1872, Pean had performed the operation five times for fibrous tumors of the uterus, and four times for fibrocystic tumors, with the result of two deaths out of the nine cases. One death is ascribed to retro-uterine hematocele on the eleventh day; the other to shock, fifty-seven hours after the operation. He gives a table, intended to be complete, of forty-four cases performed down to 1872, including those of Koeberle, of which fourteen recovered and thirty died. To this list, however, I might object that I have myself seen one fatal case, which is not recorded in it, and could easily add others from various sources."

Treatment.—Holmes's System of Surgery, 1881, has an excellent article by Hutchinson and Skene on the enucleation of fibroids through the outlet of the uterus, and refers very favorably to Thomas's method by means of the serrated scoop and his use of the clamp, also to the Battey operation for removal of the ovaries and appendages.

Agnew's Surgery, 1881, speaks of the use of electrolysis and remarks that "Evil oftener than good follows this treatment; that operative measures are sometimes adopted for the purpose of arresting hemorrhage and at other times for removal of the tumor," but, manifestly, he is not in favor of operative intervention.

Gross, in his System of Surgery, 1882, says: "The treatment of the myomatous or fibromyomatous tumors of the uterus was, until recently, very unsatisfactory. No medical treatment is of use; enucleation has resulted more favorably, and the removal of the ovaries and tubes to control hemorrhage has been more successful. In cases ineligible for enucleation, the only hope of relief is from laparohysterectomy, a most dangerous operation, first performed, if I mistake not, in 1843, by Mr. Charles Clay, of England, and since repeated in numerous instances in different parts of the world. In November, 1881, Professor C. D. Palmer, of Cincinnati, published a table of 165 cases of laparohysterectomy derived from various sources, of which eighty-four recovered and eighty-one perished, thus showing a mortality of 49 per cent. Of the 165 cases, 127 were performed for complete or partial

removal of the uterus for interstitial, broad-based, pedunculated and fibrocystic tumors, with sixty-two recoveries and sixty-five deaths, or a mortality of 51 per cent. Of thirty-eight cases in which the tumors were pedunculated and the uterus remained undisturbed, there were twenty-two recoveries and sixteen deaths, or a mortality of 42 per cent. It is worthy of note that there has been a marked increase in the success of both these operations, as performed within the last few years, owing, doubtless, to the greater care exercised in the early detection of the cases, the operative procedure and the after-treatment."

Erichsen's Science and Art of Surgery, 1885, refers to the subject as "more advanced, also to the ablation of the entire mass of the tumor, including the body of the uterus, together with the ovaries and tubes, and as recently having been regarded the most satisfactory mode of dealing with such cases." He also describes supravaginal hysterectomy by the use of the Koeberle serre-nœud. "The intramural variety of fibromyoma occurs in one of two forms. The first of these may be described as a more or less uniform hypertrophy of the uterine tissue, constituting the tumor commonly known as a soft fibroid. This enlargement is usually accompanied by profuse uterine hemorrhage, which may occasionally necessitate active surgical interference. In such cases either one of two operations may be performed for the relief of the patient, viz., removal of the uterine appendages, with a view to arresting hemorrhage and promoting atrophy of the growth by premature induction of the menopause; or else the above described operation of hysterectomy, which is, on the whole, the most satisfactory mode of dealing with these tumors."

Byford, in his work, "Diseases of Women, Medical and Surgical," 1888, says: "The last measure to be resorted to for the relief of patients afflicted with these tumors is laparohysterectomy, or the removal, partially or wholly, of the uterus with the tumor."

Gerster, in his "Aseptic and Antiseptic Surgery," the same year, presents a very interesting article on supravaginal hysterectomy, refers to the use of the elastic ligature, and states that his one case ended fatally by septicemia."

"Surgery, Its Principles and Practice," Holmes, edited by Pick, 1889, refers to hysterectomy more particularly after Koeberle's method, also to oophorectomy, but gives no tables as to results.

"Roberts's Surgery," 1890, refers to fibromyomatous tumors, and says they are often called fibroids because they resemble

fibromas. He also refers to their removal through the outlet of the uterus, says the subserous can only be treated by abdominal section, and may be removed by enucleation, extirpation or hysterectomy. He also described Apostoli's method by use of galvanism and the removal of the ovaries to bring on the menopause.

Thomas and Mundé, "Diseases of Women," 1891, referring to curative medical means, mentions Professor Hildebrant, of Königsberg, who some twenty years before had reported a number of cases of fibroids of different varieties which he had benefited, and in part cured, by an injection of a solution of ergot under the skin. In some of his cases the result was simply marvelous, even large tumors entirely disappearing after a comparatively limited number of injections, and where the tumor did not disappear its diminution was marked, the hemorrhages ceased, and the pains were relieved. To a certain extent the inventor's assertions were true, but the disadvantages attending it led to its abandonment, the chief of these being the pain and suppuration, the danger of causing gangrene and sloughing of the tumor, and, finally, the increased employment and success of the removal of these tumors by laparotomy or their control by the local application of the galvanic current."

My personal experience regarding the use of ergot corresponds precisely with the statement of the above authors. Pozzi, Medical and Surgical Gynecology, 1891, says: "The treatment of fibroma may be divided into medical and surgical. Medical treatment is often only the treatment of the symptoms, the chief agent being electricity, and a new drug which I have used with good results, lately introduced into European practice from America, by Freund, is the fluidextract of hydrastis canadensis." In regard to hysterectomy he states: "it is not a deliberately premeditated operation, but the product of diagnostic error, the surgeon when opening the abdomen to remove a presumably ovarian tumor finding himself confronted with a fibrous tumor of the uterus. The first who committed this mistake—Lizars, 1825, Diffenbach, 1826, Atlee, 1849–51, Baker Brown, Cutter, Deane, Mussey and Smith—recoiled from the terrors of an unknown operation and hastily closed the abdomen without finishing. Fourteen cases of this kind were published during this period of which five were followed by death. Clay and Heath, 1843, and Burnham, 1853, were the first to undertake the partial extirpation of the uterus; Kimball was the first to propose hysterectomy for an interstitial fibroma, which was the cause of violent

hemorrhage, the patient recovering. Koeberle was the second to do the operation, but the exact determination of the diagnosis, the rational choice of an operative technic, and the absolute novelty of the subject in Europe gave exceptional value to his case. The report which he published on this occasion made the operation the fashion of the day."

Ashurst, "Principles and Practice of Surgery," 1893, says: "Subserous uterine fibroids have, in a number of instances, been removed by abdominal section, the operation sometimes involving the extirpation of the entire uterus and both ovaries. This mode of treatment, under any circumstances, is replete with danger and can only be justifiable in exceptionable cases. The statistics of the procedure show, according to Dr. Bigelow, in 359 cases collected from all avaliable sources, that the mortality was 132, or nearly 37 per cent. Keith himself, the most successful living hysterectomist, has abandoned the operation in favor of Apostoli's galvanic method. Dr. Sutton has removed a subserous fibroid through an incision in the posterior wall of the vagina, but the patient died in six hours. Dr. Ashurst also refers to oophorectomy in cases of bleeding uterine fibroids."

"Moullin's Treatise on Surgery," edited by Hamilton, 1895, gives a very clear account of the operation of supravaginal hysterectomy, Koeberle's method, also refers to Tait's mode, his clamp, and large corkscrew for extraction of the tumor, and the difficulty of application of Koeberle's serre-nœud if the appendages are short and not well up. He speaks of the tightening of the loop by means of the key with great clearness. While mentioning favorably the advances made by the use of the clamp and treating the pedicle extraperitoneally, and referring earnestly to the adoption of the elastic ligature, as suggested by Pozzi, as being greatly superior to the Koeberle serre-nœud, he says very pertinently: "Hitherto the results obtained by the extraperitoneal treatment of the stump in hysterectomy have been so immensely superior to the intraperitoneal method that it has been almost universally accepted. It is obvious, however, as was the case in ovariotomy, that if the results of the latter could be improved, it possesses many and greater advantages over the extraperitoneal method. Recent experience tends to show that a change may be expected in this direction."

In a "System of Surgery," Dennis, 1896, Dr. Wm. M. Polk, in an article on "Surgical Disorders and Diseases of the Uterus," says: "Enucleation is viewed with a good deal of favor, pan-

hysterectomy, morcellation, ligation of the uterine arteries referred to, and removal of the entire uterus and tumor through the vagina is endorsed; he speaks of removal of the tumor and uterus without removing the ovaries, makes use of the term myomectomy and refers to Hegar's operation of ligating extraperitoneally, with fixation of stump with peritoneal attachment; also Pean's extraperitoneal fixation of pedicle, the use of the elastic ligature and fixation pins." His article is very complete and almost to the point of presenting the operation of intraperitoneal treatment of the stump in supravaginal hysterectomy.

Kelly's Operative Gynecology, 1898, brings us to the last decade of successful treatment of fibroids by the method that is now made use of by most operators, that is, hysteromyomectomy, supravaginal hysterectomy, panhysterectomy and occasionally the vaginal route. The history is most complete, due credit is given to the various operators for the advances made, and the work will ever remain one of the most valuable contributions to this part of abdominal surgery.

FINAL REMARKS.

In this atmosphere one can realize somewhat the struggles the older surgeons passed through in bringing the subject up to a plane of successful diagnosis and surgical treatment. At the same time the work of the pathologist gradually relieved the minds of operating surgeons by developing the fact that fibroid tumors were not malignant in themselves, and were not to be classified with cancerous growths. If there is any one part of surgery more brilliant than another it is that which illustrates the pathology of forty years ago and that of to-day, particularly the latter as represented in the recent grand work of Cullen on "Adenomyoma of the Uterus." Could anything be more impressive and more pleasing to the surgeon than the study of such volumes in the proper understanding of this subject?

Each operator to-day may have some special points in the technic of hysteromyomectomy or supravaginal hysterectomy, but in the main it is done so carefully, so deliberately, and brings about such excellent results that I look upon it as one of the most brilliant chapters in the development of abdominal surgery. No operator can have more gratifying feelings of respect and admiration than I have for the men who worked so earnestly

and, I may say, somewhat as my associates, in the development of this field of surgery. It is true there are yet cases in which, after exposing the uterus and fibroid, and the field of operation, that simple myomectomy can be successfully performed, but they are not many. Undoubtedly, in some cases, it is wise to leave the healthy ovaries behind.

There are many questions that one's experience will aid in deciding as to whether every fibroid requires removal. My own experience is in the direction that I have seen patients carry a fairly good-sized fibroid for years, passing through the menopause successfully, then the gradual absorption of the mass apparently taking place, but the percentage is exceedingly small. I have seen a small fibroid that gave the patient so much distress in the way of pressure, either upon the rectum, against the bladder, upon some nerve trunk, or interfering with menstruation in such a way that a radical operation became necessary. I have seen cases of fairly good-sized fibroids in the lower segment of the uterus that interfered so seriously with delivery of the child that a radical operation had to be performed. I have seen fibroids disappear with a pregnancy, but little of this is new, and all surgeons have had experiences of this kind. When the fibroid is likely to interfere with the urinary tract, when it is a source of pelvic peritonitis, whenever in any way it becomes a disturbing element, although it may be small in size, it becomes a case for operative intervention. There can be no line of treatment so successful as the operation for removal of uterine fibroids, either a complete panhysterectomy or one in which the cervix is preserved.

Much of this success is due to the early work of American surgeons, yet the French and English surgeons have bravely borne their part. To no one factor can so much credit be given, and praise bestowed, as that of the discovery of aseptic surgery.

SURGERY OF THE SPLEEN WITH SPECIAL REFERENCE TO TRAUMA, A METHOD OF ENCAPSULATION, AND REPORTS OF CASES.

BY

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DURING the past few years, while engaged in surgical work at the Saint Louis City Hospital, the writer has had occasion to see and to operate on a number of cases of disease and injury to the spleen. In the following paper he will try to point out several lessons that have been gained from his experience with cases of this nature, and to describe the treatment of injuries to the spleen by a method of encapsulation, which method to his knowledge has not been mentioned in text-books or reports on the subject. In a general hospital where emergencies are met with the spleen is more often the seat of injury than of disease, and, therefore, the reports of the cases which follow deal chiefly with injuries rather than diseases of this organ.

Dr. George Ben Johnson, in his treatise on splenectomy (*Ann. Surg.*, July, 1908), quotes Berger who, in 1892, collected seventy-six cases of ruptured spleen which were treated by splenectomy, there being thirty-eight recoveries and twenty-eight deaths. Of penetrating wound the same author reports six cases of gunshot wound, all treated by splenectomy, with two recoveries and four deaths, and seven stab wounds of the spleen, also treated by splenectomy, with five recoveries and two deaths. Of all traumatic lesions of the spleen there were reported up to 1900, thirty-seven cases with twenty recoveries and seventeen deaths. Since 1900 the same author collected 113 cases with seventy-nine recoveries and thirty-four deaths. There were reported up to 1908, 150 cases of splenectomy for injuries and wounds of the spleen with ninety-nine recoveries and fifty-one deaths, a mortality of 34 per cent. The mortality rate from operation on injuries to the spleen must necessarily be high because these injuries are attended frequently by shock, hemorrhage and injury to other organs.

The indications for operation on the spleen are trauma which may be due to stab wounds, gunshot wounds, explosions, to sub-

cutaneous rupture and to prolapse. Other indications for surgical interference are wandering spleen (in which instance there may be torsion of pedicle or intestinal obstruction), hypertrophies and enlargements, cysts, abscesses, tuberculosis, syphilis, and other constitutional diseases. Patients suffering from injury to the spleen usually present very pronounced symptoms. If the injury is produced by penetration the location of the wound may call attention to the organ, and hemorrhage from the spleen with the attending symptoms may easily be explained. In subcutaneous rupture the diagnosis is often obscure. Careful inquiry regarding the nature of the injury should be made, and when the left side has been the seat of a blow the possibility of injury to the spleen should not be overlooked.

Berger in his statistics states that 51.8 per cent. of all cases of splenic rupture prove fatal in the first hour from hemorrhage. It is, therefore, hemorrhage and shock that are among the chief symptoms which the patient presents when he enters the hospital. Patient's extremities are cold and clammy, face and lips pale, he has an anxious expression, nostrils are widely dilated, the eyes sunken, respirations mostly costal, and there is often vomiting. The pulse is weak and rapid. The patient is usually very restless and complains of thirst. He may soon pass into a stage of collapse. There may be evidence of a penetrating wound which would indicate injury to the spleen. With history of a fall there may be an abrasion or injury to the left side. In most cases that have come to my notice the injury has been caused by blunt objects, such as a wagon tongue, the edge of a bucket, gate posts, and the like. On the other hand, there may be no contusions or evidence of injury. The patient usually refers the pain to the left upper quadrant. If the ribs have been injured there is difficulty of respiration which is usually increased. The abdominal muscles are rigid. Percussion often reveals dulness in the left flank, though this is not an invariable sign. The accumulation of blood in the peritoneal cavity often also causes intense pain in the lower part of the abdomen. The conditions which bring about rupture or injury to the spleen are sometimes of such a violent nature that other viscera and parts of the body are involved and the symptoms of injury to the spleen are thereby obscured. These cases will often tax the judgment of the surgeon to the utmost.

The diagnosis of injury to the spleen is usually easy when there are penetrating wounds where exploration can easily be made

with the finger and the nature of the wound in the organ ascertained. It is customary to explore injuries of this nature, and even in injuries to the chest the exploring finger may often pass through the diaphragm and locate an injury in the spleen. Therefore all stab and gunshot wounds should be carefully explored. In rupture of the spleen the history of the case is often an important factor in determining the cause. Enlarged and malarial spleens may easily be ruptured, and when the patient complains of intense pain in the region of the spleen with symptoms of hemorrhage and rigidity of the abdominal muscles, a probable diagnosis of rupture of the spleen should be made. But in certain cases where the injury is of a severe type a positive diagnosis can only be made by exploratory operation which should be done at the earliest possible time.

The prognosis depends largely upon the character of the injury (stab wound, gunshot wound or subcutaneous rupture) and also upon the attending complications, such as shock, hemorrhage, sepsis or the involvement of injuries to other organs or to the body. Shallow stab wounds usually heal without producing serious complications. Gunshot wounds of the spleen are usually very serious, and may cause great hemorrhage. The hemorrhage is greater when the wound is near the hilus of the spleen, marginal injuries usually being less serious. Rupture of the spleen is always a serious injury, and the prognosis in all of these cases is very grave. The rupture may be merely a rent in the organ. It is often stellate in shape and not infrequently the spleen is so fractured that the fragments become detached. We should consider rupture of the spleen a very serious complication.

Severe injuries to the spleen resulting in hemorrhage usually require ligation of the splenic vessels which necessitates splenectomy. In such instances the function of the spleen is always a matter for consideration. From experiments on animals, from our own experience and that of other surgeons we have learned that the spleen may be removed without serious injury to the organism. Certain observers have noticed after splenectomy an increase in the size of the lymph glands and that the bone-marrow becomes reddened and denser. It was also supposed that the organ had to do with the destruction of red corpuscles. In certain instances the spleen causes a marked diminution in the number of red corpuscles and in the quantity of hemoglobin. It is therefore inferred that the spleen is normally concerned in the formation of red corpuscles, while

others have asserted that splenectomy has no effect upon their number. The estimation of the erythrocytes and leukocytes and hemoglobin was carefully worked out in one of our cases of splenectomy by Dr. Jerome E. Cook (*St. Louis Medical Fortnightly*), in which it was shown that shortly after the operation there was a diminution in the number of red corpuscles, an increase in the number of leukocytes, and a hemoglobin estimation of 37 per cent.

The leukocyte estimation during the two years of examination remained about the same. There was, however, a gradual increase in the number of erythrocytes and also an increase in the percentage of hemoglobin. It has also been shown (Howell, Text-book of Physiology) that there is a slow expansion and contraction of the organ synchronous with periods of digestion, and that in addition there are rhythmical contractions and relaxations of the organ occurring in cats and dogs at intervals of about one minute, and it is believed that these contractions serve to keep up a circulation through the spleen and to make the vascular supply more or less independent of variations in general arterial pressure, so that this special arrangement of the circulation makes the spleen unique among the organs of the body. It has also been suggested that the spleen is concerned in the production of uric acid, and latterly a theory has been proposed by Schiff and Herzen in which the spleen is regarded as producing something (an enzyme) which when carried in the blood to the pancreas acts upon the trypsinogen contained in this organ converting it into trypsin.

Dr. Howard A. Kelly (Gynecology and Abdominal Surgery, 1908), in his chapter on operations on the spleen, states that splenectomy is a typical operation, that the economy suffers no detriment from the loss of the organ. He considers conservative operations involving resection, suture or suspension of the organ in cases of injury as more troublesome and more dangerous than total extirpation, but, however, he does not reject all conservative methods as they may be proper from time to time in peculiar suitable cases.

In injuries to the spleen, especially in incised wounds, nature makes an effort to repair the damage, and if the hemorrhage is not too great a blood-clot is formed at the seat of injury and hemorrhage thus controlled. It is also frequently noticed that when the spleen is irritated by injury the omentum finds its way to this locality and helps in a measure to repair the damage.

When the spleen is ruptured, especially when the organ is enlarged and soft, and when the rupture extends deep into the pulpy portion, the hemorrhage is severe and the blood accumulates in the splenic fossa. When the body is kept quiet there is a tendency to clot formation, and a large blood-clot will form in this locality. With movements of the body hemorrhage is increased, and the entire abdominal cavity may become filled with blood. As in cases of hemorrhage in ectopic pregnancy so also in hemorrhage from the spleen, when the body is at rest and the blood-pressure is reduced to a minimum nature makes an effort to readjust conditions, and a more or less firm clot is formed about the organ and hemorrhage effectually controlled. In a few days readjustment takes place, the patient rallies and the pulse becomes stronger and of better volume. In certain instances a permanent healing of the rupture thus takes place. In other instances the blood-clot in this locality becomes encapsulated, the contents become soft, the spleen pulpifies and hemorrhage is thus unexpectedly reestablished. In certain instances the spleen is found not only to be fractured, but the contusion is so severe that degeneration of substance takes place resulting in a general septic condition. A general peritoneal irritation and an absorption of blood usually causes an elevation in temperature. The pathologic conditions, therefore, in injury to the spleen and especially in rupture of the organ are such that surgical measures are distinctly indicated.

In the treatment of injuries to the spleen the aim should be to control hemorrhage, and those measures that are of service in the control of hemorrhage in other parts of the body are applicable here also. Rest is of prime importance, and sedatives (morphine) are indicated if the patient is restless. With suspected injury to the spleen the patient should lie in bed with the head lowered so that the blood may accumulate in the splenic fossa, and thus encourage clot formation. When the diagnosis is in doubt exploratory laparotomy should be insisted upon, for it is better to resort to this procedure than to lose time by refined diagnostic measures.

The surgical treatment must necessarily be modified by the nature of the trauma. Shallow stab wounds usually require little treatment and may be repaired by suture. Incised wounds heal more kindly than ruptured or jagged wounds. Therefore, in gunshot wounds, especially if the injury is severe, splenectomy may be indicated. The hemorrhage from marginal wounds may

sometimes be controlled by packing, though, if the injury is severe, packing should not be relied upon. In extensive wounds simple suture or clamping of the organ is not reliable. If the patient is in great shock the surgical measures should be carried on with great dispatch, and it is safer to resort to splenectomy than to waste time on more conservative methods.

The hemorrhage having been controlled by operation the postoperative measures should be directed to the treatment of shock and hemorrhage. Rest is essential. The heart should be stimulated by the administration of camphorated oil, ether, aromatic spirits of ammonia, and whiskey. These can be given hypodermically, and with the adjunct of hypodermoclysis, or intravenous infusion, or direct blood transfusion, the loss of fluid by hemorrhage can be replaced. Enteroclysis or continuous rectal irrigation should also be used.

When exploratory laparotomy and splenectomy are indicated the location of the incision is important. We have found an incision along the left rectus muscle the most desirable. This will give ample opportunity for exploration of the stomach and intestines and other viscera, and will permit of a splenectomy and operations on the spleen when indicated. The rupture in the spleen at times is difficult to locate, and therefore careful search is required. If the patient is in a condition of collapse splenectomy is the operation of choice. The adhesions and ligaments about the spleen should be freed by tearing them from the diaphragm and parietes, thus avoiding additional injury to the organ. These adhesions having been removed the organ is shelled out of the fossa, lifted into the wound and held in the left hand, the pedicle lying between the fingers. Clamps or ligatures may then be placed, and the pedicle tied off with strong interlocking silk or catgut sutures. Ligation having been performed the spleen may be easily severed from its attachment. The stump should then be carefully examined for hemorrhage and returned. Care should be taken not to include the tail of the pancreas in the ligature nor to incise it when removing the spleen. As a rule, splenectomy is a simple operation. In certain instances when the organ is large operators have made transverse incisions through the rectus, though this is usually not necessary and tends to the formation of postoperative hernia.

When dispatch in operation is demanded splenectomy is the operation of choice, but in instances where an early diagnosis has been made and exploratory measures have been taken and the

patient is in good condition conservative methods appeal to one. Because splenectomy is an easy operation seems to me to be no reason why that organ should be sacrificed if other measures may be resorted to. Especially are we warranted in saving the spleen since its exact function is not well known. We know that in typhoid fever, in malaria and in septic conditions it plays an important rôle, and from a physiological consideration it may later be demonstrated to have a definite and important function.

From the study of certain cases that have come to my notice I have devised a method of encapsulation with omentum which I believe in certain instances should receive consideration. The use of the omentum as a covering for denuded surfaces and in plastic work upon the intestines, liver and other organs is well known, but I am not aware of its use as a method of encapsulating and supporting the spleen in instances of injury to this organ. In the method of encapsulation of the spleen in trauma the following procedures have been used.

Incision is made as in splenectomy along the left rectus muscle, and the organ is delivered into the wound and held in the left hand. All parts of the organ are inspected and injuries located. In the case of rupture or perforations by bullet or penetrating instruments catgut sutures threaded on long needles are used, and stitches taken through the entire organ in such a way that when tied he pressure controls the hemorrhage. These sutures are placed deeply and across the line of fracture. The ends of the ligatures are clamped with forceps. The omentum is then wrapped around the organ, and the ends of the ligatures brought through and over the omentum and securely tied. In this way the suture is used in controlling hemorrhage and fixing the omentum to the spleen. A few sutures may be necessary to fasten the omentum around the margin or pedicle of the spleen. Hemorrhage having been controlled the spleen, thus encapsulated with the omentum, is returned into the splenic fossa. A supplementary incision is made in the flank through which gauze pack is placed against the spleen in such a way that adhesions may form to retain it in place. A gauze pack is also placed from above and allowed to come through the laparotomy wound. In case the abdominal cavity is filled with blood it is usually advisable to insert a glass drainage-tube in the pelvis through a suprapubic stab wound. When time will permit, flushing the abdominal cavity will be found of great service in relieving the shock and preventing postoperative

complications resulting from the absorption or infection of blood in the abdominal cavity. The laparotomy wound may be closed in layers or by through-and-through suture.

In three instances in which this method was tried for gunshot wound and for rupture of the spleen the results have been satisfactory. This operation suggested itself to me from observations made on cases of ruptured spleen which had been treated on the expectant plan, where in one case secondary hemorrhage resulted after eight days, and in another case after four days. A study of these cases led me to believe that the spleen when ruptured should be given some support, preferably by encapsulation, that the rest treatment is not to be relied upon, and that in all cases where injury is suspected exploratory laparotomy is indicated, if not during the period of shock, at least when the patient has revived sufficiently to bear operation. A synopsis of the following two cases shows the importance of furnishing the spleen with support.

CASE I (4977, Sept., 1904).—Patient entered the hospital with a history of having been struck in the left side by a wagon tongue. He was suffering greatly from shock, was in profuse perspiration and was anemic. Upon examination of the left side of the body, dulness was found in the splenic area and left flank. There was also here a great deal of pain. There were no marks nor contusions to indicate severity of the blow. Diagnosis of rupture of the spleen with hemorrhage was made, but the patient's condition seemed so serious that it was thought that an operation at this time would prove fatal. Patient was kept quiet, and his condition gradually improved. By the third day, the symptoms had subsided, and the patient was regaining his normal condition. He was doing so well at this time that operation was not considered necessary.

A week later, on making the rounds of the hospital, the patient, who had been doing nicely, was found in a condition of shock. His lips were blanched, he was in profuse perspiration and was semiconscious. It was evident that he was suffering from hemorrhage, and he was at once sent to the operating-room. Under general anesthesia, an incision was made along the left rectus muscle and the peritoneal cavity was found filled with blood. The splenic region was explored, and here an immense clot was encountered, part of which had formed fibrous capsule around the spleen. The hand could easily be introduced into this encapsulated area, and the friable pulpy substance of the

spleen could be felt. Hemorrhage was so profuse that this region was merely packed with large quantities of gauze. The patient was put to bed as quickly as possible, but he did not rally, death coming on shortly after the operation.

The point of interest in this case is that the patient had rallied from the primary effect of ruptured spleen, that the clot which had formed was sufficient to control the hemorrhage, and the patient was thus allowed to regain his normal condition. With increased blood-pressure and increased movement, the patient still being confined to his bed, the clot about the spleen was disengaged, and the hemorrhage was thus unexpectedly reestablished, the patient dying from secondary hemorrhage resulting from rupture of the spleen.

CASE II (6975, Dec., 1907).—Patient was a foreigner, and it was ascertained that he had fallen on his left side in a machine shop. When he entered the hospital, patient was rather pale, had contusions of both hips and over the right ankle. It was learned that while working in the car shops a car sill struck him on the hip, knocking him against a brick wall. There were no bones broken, and when catheterized the urine was found to be clear. The abdomen was tender to pressure on the left side, but there was here no rigidity nor bruises. There were no signs of internal hemorrhage, and the diagnosis of contused hips was made.

The patient by the fourth day was able to walk, and desired to leave the hospital. While waiting for his discharge in the receiving-room, he was suddenly taken with abdominal pain, and had to lie down. His condition seemed to be so serious that he was again sent to the ward. Here, he complained of pain over the crest of the ilium on the left side. His pulse was fair but rather fast. There was no great abdominal tenderness, nor rigidity, nor dulness, nor fluctuation. Patient, however, showed signs of shock and of internal hemorrhage. He gagged several times, but did not vomit. His condition did not improve, and diagnosis of internal hemorrhage was made. His pulse was 96 and full and strong. Soon, however, the pulse-rate increased to 138, and was thready, his temperature became subnormal, his face cold and pallid, and he was in cold perspiration. Extremities were also cold. Patient now showed typical signs of severe internal hemorrhage. Abdomen was enlarged and tender on palpation, and there was now marked dulness in the flanks. Patient also vomited and complained of dizziness and

thirst. The case was recommended for operation, which was performed by Dr. Shutt.

At operation examining hand revealed the spleen in its normal position with the omentum wrapped about it and also a great many blood-clots. When the peritoneum was first opened, a considerable quantity of blood escaped. The abdominal incision was enlarged by cutting the rectus transversely. The pedicle of the spleen grasped and compressed. The spleen was delivered from the abdominal wound and splenectomy was performed. The hemorrhage was so severe that the patient died on the operating-table.

In this case also the patient's death was due to secondary hemorrhage. The primary condition was controlled by rest, the clots of blood and omentum having brought about arrest of the primary hemorrhage. The increased mobility and consequent dislodgment and fragmentation of the clots led to a secondary hemorrhage which proved fatal.

A study of these cases and my sad experience in cases of splenectomy led me to believe that better results could be obtained by encapsulating the spleen, which seemed to be Nature's method of combating this condition.

In the following three cases of hemorrhage from the spleen, the omentum was utilized to encapsulate the organ, and in each instance secondary hemorrhage was avoided, the patients making a successful recovery.

CASE III (8218, Feb., 1907).—The patient came to the hospital with a history of gunshot wound, one of the bullets entering the left side, taking a direction through the lower part of the chest to the kidney. When catheterized the urine was found to contain blood. Under general anesthesia, incision was made along the outer border of the left rectus muscle. The abdominal cavity was filled with blood. The stomach, and transverse colon were examined, and no perforation found. The spleen was examined *in situ*. A large rent was found along the middle portion. The splenic adhesions were broken up, and the organ delivered into the wound. The rent caused by the bullet almost divided the spleen into two equal parts, the rent being large enough to admit the finger. With large surgical needle and chromicized catgut, three large interrupted sutures were taken through the entire organ and were tied, and the injured margins thus approximated. Suture was also taken through the margin of the spleen. There was profuse bleeding

from the pulpy portion, as well as from the surface where the capsule had been removed.

The spleen was easily delivered and extirpation of the organ could very easily have been made. It was, however, desired to preserve the organ if possible. The omentum was brought up and wrapped around the spleen and sutured, covering the severed portions. The organ thus encapsulated with the omentum was returned into the abdominal cavity. A supplementary stab wound was made in the flank, and three gauze drains placed in the dependent portion to prevent the spleen from falling downward. These drains took their exit through the incision in the flank. Gauze pack was also placed above and in front of the spleen, these packs being held in place by suture through the abdominal wall near the costal margin. These packs were allowed to come through the surgical abdominal wound. Closure of the wound was made with interrupted silkworm-gut suture, a glass drainage-tube having previously been placed in the pelvis through a supplementary suprapubic opening.

The patient recovered from the effects of this operation, and after all the gauze packs were removed and the patient was considered convalescent he suddenly became ill with symptoms of bowel obstruction. The peristaltic intestinal wave could be seen through the abdominal wall, and in the early stages of this condition the patient was subjected to a second laparotomy, and intestinal adhesions, which had formed around the glass drainage-tube, had compressed the bowel so as to completely occlude its lumen. These adhesions were easily liberated, the denuded surface covered over with Lembert suture, and abdominal wound closed in layers. The patient made an uninterrupted recovery from this condition, and left the hospital feeling well. I had occasion to see him some months later, when he stated that he had no symptoms or pain as a result of his injury.

Case IV (2737, July, 1907).—This patient while trying to board a street car slipped and fell on a dinner-pail which he was carrying in his left arm. The patient when brought to the hospital complained of pain in the left side of the chest and in the hypochondriac region. The muscles of the abdominal parietes were rigid and were on guard when palpated. In the lower portion of the chest on the left side was a large area of dulness surrounding the normal splenic dullness. Patient was pale and anemic. Pulse was 104, respirations 34, temperature 97.6°. The patient

soon became much weaker, the pain became more severe, the patient presented the picture of one in shock. Diagnosis of ruptured spleen was made, and the patient operated on for this condition.

Incision was made along the border of the left rectus muscle, and the exploring hand encountered the spleen which was ruptured. The spleen was loosened from its normal position, and was brought forward into the wound. The rupture extended deeply into the substance of the spleen and gave rise to a great deal of hemorrhage. The spleen was sutured through and through with chromicized catgut and tied sufficiently tight to control the hemorrhage. The omentum was brought forward and wrapped around the organ and sutured. The spleen was then replaced in the cavity.

A supplementary incision was made in the flank for drainage of the splenic region. A gauze pack was placed above the spleen, and the end of the pack allowed to come through the laparotomy wound. Wound itself was closed with interrupted silkworm-gut sutures. A glass drainage-tube was placed through supplementary stab wound. Patient was put to bed in a critical condition. For some days the patient's temperature was somewhat elevated above normal, but after the original drains were all removed the patient's condition improved and he was discharged from the hospital. He reported at the hospital several times, was in good condition, and has left for Europe.

CASE V (4977, Sept., 1904).—The patient, a colored boy fifteen years of age, fell from a scaffold and sustained a compound Colles's fracture of right arm, a simple Colles's fracture of left arm and severe contusions of the head and body. Three hours after entering hospital he complained of severe pain in the back and abdomen, and a diagnosis of rupture of spleen was made. The patient's mother would not permit operation. The next morning the patient's record was: temperature 104.2°, respirations 42, pulse 140, and the mother now gave her consent to operation, which was undertaken with reluctance and as a last resort. Rupture of spleen was found, and the repair was quickly made by method of encapsulation. The patient grew gradually worse, and died on the next day.

CASE VI (4074, Sept., 1908).—The patient, male, age nineteen, entered the ward with a history of having been struck by a bolt over the ninth rib in the axillary line; he also gave history of malaria. His record was: temperature 100.6° F., respirations 40,

pulse 134, leukocyte count 20,000, hemoglobin 75 per cent. Patient was anemic, respirations costal and shallow, abdominal muscles rigid and tenderness most marked in the left hypochondrium; bowels had moved once since accident. No contusion or marks of injury over body. Diagnosis of rupture of spleen was made, and patient prepared at once for laparotomy.

At operation, spleen was found enlarged and a stellate rupture of the organ was present. The injury was repaired by the method of encapsulation, suprapubic and flank drainage instituted and the patient put to bed in fairly good condition. The patient had lost a great deal of blood, and for a number of days his pulse-rate was accelerated. On one occasion the patient's temperature rose to 101.8° F., but there were no symptoms of peritonitis. The patient is now completing his second week of convalescence, his condition is good, and a complete recovery is anticipated. (Patient recovered.)

The three cases in which I have used the method of encapsulation with success have convinced me of its practical value in those instances in which it is desired to save the organ. Based upon the experiences as reported in Case I and II, the method is useful in supporting the spleen and in preventing secondary hemorrhage. The report may be supplemented by synopses of other cases which came to my attention and which illustrate a number of interesting points in regard to the surgery of the spleen.

Case VII (6528, Nov., 1904).—Patient entered hospital suffering with a stab wound of the left side of the chest, the penetrating instrument severing three ribs in the mammary line near the costal margin. The patient was in a state of collapse with grave symptoms of hemorrhage. He was pulseless, the extremities were cold, pupils dilated and the breathing was stertorous. Laparotomy was performed as a last resort. The pleural and abdominal cavities were filled with blood and upon examination an incised wound of the spleen was found. The diaphragm had also been incised and in addition an old diaphragmatic hernia was encountered, the pear-shaped sac extending into the pleural cavity and containing omentum. The hemorrhage having been controlled, drainage of pleural and abdominal cavities established, and patient put to bed in critical condition. He rallied after the operation, but died in a few hours from symptoms of hemorrhage and shock.

Case VIII (1645, May, 1904).—Patient brought to hospital

with history of having been cut by another man. Examination showed superficial wound of left cheek and also a stab wound in the left midaxillary line at the tenth interspace penetrating into the pleural cavity through the diaphragm and into the spleen. His general condition was good, there were no symptoms of hemorrhage, and the wounds were merely treated with moist antiseptic dressings. The patient made a nice recovery, and left the hospital in ten days.

Case IX (3255, Aug., 1906).—The patient had received a stab wound on the left side at the location of the eleventh interspace in the mammary line. The omentum was found prolapsed through the wound. The patient's general condition was good. Laparotomy was performed by Dr. John Young Brown, the incision being along the left rectus muscle below the costal margin. An incised wound of the spleen was found, and the diaphragm was found perforated. The hemorrhage was slight, and there was no other injury to viscera. A portion of tenth rib was resected, and the diaphragm repaired from the pleural side. The laparotomy wound was closed in layers, but drainage was established through the wound in the chest. The patient made an uninterrupted recovery, and left the hospital in twenty days.

Case X (4907, Oct., 1905).—The patient on entering the hospital was in a mild degree of shock. The mucous membranes of mouth were pale, and the patient was suffering from hemorrhage. He had received a penetrating stab wound in the postaxillary line on the left side between the tenth and the twelfth ribs involving the diaphragm and spleen. Operation was performed by Dr. William J. Doyle. Incision along left rectus muscle, abdomen filled with blood. Spleen examined, and wound two inches long found on posterior surface. The wound in the diaphragm was inaccessible for closure through abdominal route, being located posteriorly. No injury to other abdominal viscera found. Splenic hemorrhage controlled by two large packs. Glass drainage-tube placed into pelvis through stab wound over pubes; small drain placed through original stab wound. Postoperative course uninterrupted, patient leaving hospital in twenty-seven days.

Case XI (9174, March, 1908).—Patient, a female, age eighteen, entered hospital with multiple incised wounds of the body. One extended from the posterior axillary line to the mammary line through the intercostal space into the pleural cavity and on a

level with the nipple. A second wound also on the left side extended across the chest opening wide the pleural cavity; the instrument had severed the diaphragm and had cut a long gash in the spleen. Through the wounds in the diaphragm and the chest, the spleen, stomach and intestines had prolapsed. Laparotomy was performed, the viscera returned and all wounds repaired. The patient died on the fifth day from gangrene of the lung.

CASE XII (6054, Nov., 1907).—Patient was stabbed in left side in posterior axillary line between eighth and ninth ribs. Exploration with the finger showed injury to diaphragm and spleen; considerable quantity of blood in pleural cavity; abdominal muscles somewhat rigid; no vomiting. Wound in spleen packed with gauze. Uninterrupted recovery.

CASE XIII (1230, May, 1906).—The patient entered the hospital with two gunshot wounds of the chest near and above the level of the ensiform cartilage. The wounds were self-inflicted. Immediate laparotomy. Blood found in peritoneal cavity, also jagged wound of liver, two perforations of stomach, two perforations of colon and two gunshot wounds of spleen, one of the bullets still remaining in the spleen. Wound in the liver was packed, wounds of stomach and intestines repaired and spleen extirpated. Spleen was enlarged, and patient gave history of malaria. Death occurred on second day from shock and peritonitis.

CASE XIV (1873, June, 1905).—The patient tried to commit suicide by shooting himself in the left side. Bullet entered at fifth rib midaxillary line and ranged downward. Operation performed by Dr. William J. Doyle. Diaphragm was injured, fragments of bone shattering the spleen. Patient was nearly exsanguinated. Splenectomy performed. No other abdominal injury. Drainage instituted through wounds in chest and diaphragm. The patient lived for two weeks, dying from pneumonia.

CASE XV (764, April, 1907).—Patient was injured by an explosion. There were two large penetrating wounds of the abdomen. Operation performed by Dr. J. W. Shankland. The abdomen was filled with bloody fecal material. Two and a half feet of colon resected, anastomosis by use of Murphy button. Spleen was injured, repair made by suturing over denuded portion with omentum. Wound in kidney packed with gauze. Patient died soon after operation from shock and hemorrhage.

Case XVI (5927, Oct., 1904).—The patient had received a gunshot wound of the abdomen, and when placed on operating-table was very anemic and pulse was very weak. Median incision, abdomen filled with blood; no injury to hollow viscera. Spleen examined and large stellate wound found. Splenectomy performed through supplementary incision. Patient died on operating-table.

Case XVII (936, May, 1903).—This patient, a female, age thirty, had received three gunshot wounds of the chest. One of the bullets penetrated the abdominal cavity in the region of the spleen. Laparotomy was performed by Dr. Louis Rassieur, who found no other visceral injury except a laceration of the spleen. The wound in the spleen was packed with gauze, drainage being established through opening in the flank. The patient developed symptoms of pleurisy and pneumonia, but finally made a complete recovery.

Case XVIII (1206, May, 1908).—This case is of interest surgically on account of the condition of wandering spleen. The patient entered the hospital after three days of suffering, the symptoms being those of acute intestinal obstruction. She also gave a history of chronic malaria. At the operation, which was performed by Dr. C. H. Shutt, and was exploratory in nature, the intestines and stomach were found distended with gas. Examination of the pelvis revealed a spleen five times the normal size which had become incarcerated. The pancreas lay in a longitudinal instead of a transverse direction. The stomach had been drawn down, and the intestines had become twisted so as to produce a condition of volvulus. Peritonitis was present at the time of operation, the patient dying from shock.

Case XIX (9805, March, 1908).—The patient entered the hospital in a semiconscious condition with an indefinite history of abdominal pain. There were symptoms of peritonitis, and the boy was running a pronounced septic course. Pain was referred to region of appendix and to splenic area. Exploratory laparotomy performed, abdomen containing serosanguineous fluid. Appendix thick, but not acutely inflamed. Region of spleen explored through supplementary incision. Spleen slightly enlarged and mottled as if by infarction, was not removed. Patient died on second day, autopsy showing lymphatic leukemia, hemorrhagic ascites, hemothorax, infarction of spleen with areas of softening, enlarged liver showing fatty degeneration and small areas of atelectasis of lung.

CASE XX (————).—The patient gave a history of old injury to the side, but on entering the hospital his symptoms were those of malaria. The area of splenic dulness was enlarged. A pronounced leukocytosis indicated the presence of pus. Laparotomy was performed, and a large splenic abscess was encountered. The abscess was drained, the patient eventually making a recovery.

CASE XXI (3483, August, 1905).—This boy came to the hospital with history of having injured his left side while swimming. He was able to walk home, but gradually grew worse. Came to hospital four days after injury, with elevation of temperature and peritonitis. Operation performed by Dr. John Young Brown. Median incision, abdomen filled with blood and blood-clots. Spleen was ruptured and torn completely across. Splenectomy quickly performed. The patient lived for seven days, dying from symptoms of peritonitis.

CASE XXII (7167, January, 1906).—The patient arrived at the hospital in an unconscious condition, having been struck by a locomotive. Abdominal muscles rigid, and diagnosis of internal injuries made, with possible rupture of spleen. Immediate operation. Stomach and intestines uninjured. Rupture of spleen found, and splenectomy performed. Patient died soon after operation from hemorrhage and shock. At autopsy subperitoneal fractures of the liver were found, also ruptured and contused diaphragm and fracture of several ribs.

CASE XXIII (4711, October, 1905.)—While engaged in carrying freight, patient slipped and struck side and lower ribs on edge of car. When he entered hospital pulse was rapid, abdomen distended, muscles rigid and painful on pressure, dulness over lower half of abdomen. Operation by Dr. William J. Doyle. Median incision. Blood found in lower half of abdomen, but not in upper half. Spleen which was considerably enlarged was found ruptured. Rectus muscles severed transversely to permit of greater room. Splenectomy performed. The patient's course after the first week was practically normal and he made a good recovery. This case was followed for three years, and blood examinations were made from time to time. Splenectomy did not seem to impair his health.

CASE XXIV (2603, July, 1905).—When admitted to the hospital the patient was suffering from shock, great pain and symptoms of internal hemorrhage and injury. He had been run over by a wagon. Operation performed by Dr. John Young

Brown. Median incision. Abdominal cavity filled with blood. Wound found in liver which was plugged with gauze. Spleen found ruptured, and splenectomy quickly performed. After the first week his record was practically normal, the patient making a good recovery.

A review of the cases thus briefly presented emphasizes the seriousness of injury to the spleen and the necessity for early operation. In the absence of positive signs, exploratory laparotomy is distinctly indicated. If the spleen alone is involved and the patient's condition warrants, the method of encapsulating the spleen with omentum is advocated for the following reasons, namely:

That the spleen need not necessarily be sacrificed in the control of hemorrhage; that portions of the spleen may be removed, and when thus treated splenectomy need not necessarily be performed; that the danger of secondary hemorrhage is very greatly lessened, and that favorable results in suitable cases seem to warrant a continuation of the use of the method.

THE PROTECTION OF THE ACCOUCHEUR AND HIS PATIENT.

BY

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THE object of the writer is to emphasize the purely practical side of obstetrics and particularly the preparation for accouchement and its immediate sequelæ. The subject is timely, as the number and variety of maternity outfits testify, and in spite of that number and variety it is not at all an uncommon experience to make the unpleasant discovery that the wipe or napkin or water-proof material most urgently wanted is either absent or lacking in some important particular.

Although the supplies should be cheap, yet they should be sufficiently adaptable, abundant and elastic in application to meet any emergency or even any fad of the accoucheur. Many men who depend on ready-made maternity kits have been annoyed by their supplies giving out at the end of the first week, even though the financial outlay seemed ample or even large. The kits or boxes referred to are usually termed Dr. Smith's or Dr. Blank's maternity outfits, and while they may meet the requirements of Dr. Smith or Dr. Blank it by no means follows that they will meet everyone's needs nor the needs of every case. Such routine-packed boxes must necessarily be limited in contents and those contents must be neither economical nor elastic in application. The facts that they save thought on the surgeon's part and that their contents have been once sterilized count for little. The saving of thought may be dearly paid for and absolute safety demands resterilization as every conscientious man will admit.

Present-day economy implies a scrap heap and throwing away of waste material. The idea of expending ten cents' worth of time and labor in order to save one cent's worth of material has been sufficiently scored by those workers and teachers who are firm believers in economical efficiency. Imagine how this problem would appeal to such believers in true economy:

"Purchased a rubber sheet of the best material on account of its durability—cost, say, five dollars; laid it away carefully after once using. Looked at it some months later, found it ruined and valueless." In fact, economy as usually practised in labor cases is apt to be very costly in the end, and in this one matter of maternity boxes, while a saving of at least 33⅓ per cent. may be effected, that fact is secondary to the gain in efficiency that may be obtained.

Ask the average physician what preparations are necessary and what supplies should be purchased, and it will be found that for an instant his mind is a blank; then he begins to think and to enumerate articles, one at a time, depending almost entirely upon memory and experience to dictate the articles required in the lying-in room. The usual result is that some important thing has been forgotten and much time has been wasted. It is not that he does not know, but he has not formulated his knowledge. To meet this emergency I have adopted the mnemonic word "pawns."

P. stands for protectors and pads.
A. stands for antiseptics and anesthetics.
W. stands for wash-basins and wipes.
N. stands for napkins.
S. stands for sundries.

Sundries are a wash-boiler, a douche bag, a douche pan and a yard of Z. O. "moleskin" adhesive plaster. Insist on getting the last.

The protectors protect the accoucheur and the bed. Rubber is an expensive material, hard to sterilize and unsatisfactory in many ways, not the least being its liability to spoil when laid away or stored, and some sensitive women find its odor very objectionable. Despite this, it is very commonly used for aprons, sheets and gowns. The cost of two rubber sheets and an apron may be stated as about seven dollars, or rather more than is requisite for a complete outfit.

I have been using a material made by the Standard Wall Paper Co. It is intended for wall coverings, it is light in weight, it is water-proof and it sells for about 25 cents a yard of 47 inches' width. The color, weight, size and width I have found most available is known to the trade as 45X. It is a light yellow in color, it can be steam-sterilized, inasmuch as two hours in a sterilizer simply removes the odor of newness which it possesses at first in common with clean fresh paint, and owing to its width

five yards is an ample amount for an apron for the accoucheur and to replace two rubber sheets as commonly used; one on the operating-table and one on the bed. It is easily washed and consequently may be used over and over for any desired purpose; for instance, the piece used on the operat ng-table may be cleansed, sterilized and placed over the patient's mattress on the bed when a change of protectors is necessary, or the surgeon's apron may be utilized on the baby's crib, or in the absence of a hand-basin a pasteboard box or even an ordinary basket may be lined with 45X and a water-tight vessel or catch-all may be quickly made. Many uses will suggest themselves in an emergency. The mnemonic letter "P" suggests the words protectors and pads and these in turn suggest the written directions to the patient "Purchase 5 yards Standard Sanitary Wall Paper 45X and five bed pads."

At some convenient time cut this five-yard length into three pieces; that is, two of two yards and one of one yard in length. Take the yard length, fold down one edge to a depth of nine inches, the fold being the narrow side of your rectangle and consequently one yard in length. In the center of the fold make a cut four and one-half inches long in the median line, and each side of this make an additional cut of the same length, but in the crease of the fold itself. In other words, make what is called Stewart's poncho. Put your head through the crucial incision and you will find yourself fully protected by a flexible water-proof apron of light weight, long enough in front, but only hanging over the shoulders behind and therefore not suffocatingly warm. The wrong side of the goods should always be toward the person, whether of the accoucheur, as an apron, or on the bed of the patient, as sheets, or on the crib of the baby.

Antiseptics comprise one pound each of calx chlorinata (Squibbs) 35 per cent., of aluminum sulphate and of washing soda. Anesthetics need no comment, and I have gone so elaborately into the chlorine technic elsewhere that I will only add this concerning antisepsis, namely, it has been my experience that if the accoucheur leaves the vagina alone, but has his patient wash off the vulva and perineum daily (at least) for a week before the day of expectation, using a heaping teaspoonful of washing soda and also of calx chlorinata to a quart of water, avoiding any mechanical means of drying, such as wiping with towel or any means except simple evaporation, then he will often find the vulva sterile or at least free from pathogenic germs when the patient is put on the table for delivery.

Then his rubber gloves not having to pass through a contaminated ring may be as much of a protection to the patient as they are to the obstetrician. After the completion of labor and after the patient has been put to bed, have the nurse pour over the mons veneris and vulva into a douche pan below a solution of one heaping teaspoonful of aluminum sulphate and one of calx chlorinata to the quart, taking care that the fluid comes in contact with all the parts and runs between the labiæ.

This should be done twice daily, morning and evening, and then the napkin put on immediately with no attempt at wiping and without friction or other needless mechanical irritation and consequent soreness. Omit the common process of indiscriminate douching (vaginal), which may be and should be abandoned because though said flushing of vagina was adopted for reasons which seemed good from a theoretical standpoint yet, in practice the anticipated benefits do not ensue, as a few cultures will demonstrate, and furthermore said cultures will show that an ordinary vagina can best care for itself when interference is as its minimum; why then should douching be tolerated? The water in all solutions should be filtered through a piece of cheesecloth to remove grit and then boiled, and for the purposes of this article teaspoonfuls should be of maximum quantity, *i.e.*, heaped up.

The letter "W" of the mnemonic word suggests wipes and wash-basins. The latter are two or more hand-basins, the former implies the direction to the patient to "purchase one bolt of cheesecloth, fifty yards long and of five-cent quality, also two bats of cotton."

Wipes are always useful. About four dozen are enough for a start. I find most expectant mothers rather like to make things. It seems to recall something of the pleasure once experienced in preparing the trousseau. Should the patient or her nurse not be familiar with the art of folding wipes, the attendant may be obliged to demonstrate. The piece of gauze should be eight inches square; fold it from bottom to center, then fold one side two-thirds of the way across and lap the other side over till the edges coincide, finally tuck the upper end into the lower. Any hospital nurse can demonstrate the method in a few minutes, and it is a useful thing to know.

The napkins should be rolled diagonally with a layer of non-absorbent cotton in the center, and they should be held in place by the ordinary tape-holder and clasp commonly used by women at the menstrual periods. The ordinary sanitary

napkins are good, but they do not fit well and are often uncomfortable. With the ample supply of gauze aforesaid it is possible to fashion any required article of any required size.

For a gown I cut a poncho of gauze two and one-half yards long, with the hole in the center; slip it on over the wall-cloth apron before mentioned, then a half-dozen properly placed safety-pins result in an excellent gown. If you lecture, the gauze may be put over the head and at the same time cover the body. Holes may then be cut for the eyes or not, as you wish. This is effective but heating, and unless the accoucheur is doing a great amount of talking the first way will be found much more comfortable and quite as safe.

The sterile drawers for the patient are contrived in the same manner. The baby's binder is easily made and, in fact, with the material at hand no one need be at a loss for any sort of bandage. A Rose abdominal bandage fashioned from moleskin plaster has the following advantages over the old-fashioned binder. It can do no harm; it supports the abdomen, thereby preventing overfilling of the abdominal veins and consequent faintness; it does not get soiled; it keeps its place for a month; it enables the patient to sit up in bed on the third day; it prevents subinvolution, phlebitis and various other troubles caused by long recumbency and poor drainage; it improves digestion, and it certainly decreases the amount of blood lost. A smooth bandage is very decidedly preferable to a tight one. I frequently put in a small-sized rubber hose, making a U from the inside of the right anterior superior spine, extending down the groin across the mons veneris and up to the left anterior superior spine. This should lie between the two layers of the bandage and may extend at each end up nearly to the ribs. When the patient sits up, this forms a movable elastic support, and when the patient reclines, the bandage returns to its first position. Any complaint or discomfort simply means too tight a bandage as the pull and drag upon the skin will produce a widespread if not deep sore. It should never be anything but a distinct comfort and advantage; as it will be if properly applied. If an error must be made in its adjustment, that error should be in favor of too loose rather than too tight.

As set forth in my pamphlet "A Humble Sterilizer," any and all kinds of wet sterilization may be obtained with a wash-boiler, with a few holes bored in the cover and a criss-cross netting of ordinary string to hold the fabrics out of the water. Wipes,

sheets, etc., should be packed in the usual packages (six wrapped in one or two wrapped in one), sterilized and then taken out, wrapped in several thicknesses of newspaper and exposed to dry heat in an oven—the scorching of the paper giving the danger signal of excessive heat. Dry heat is not required for the 45X, as it requires vigilance to prevent its becoming brittle, but it drys quickly without baking, and steam sterilization is efficient. Cloth articles should be baked and packed away with their paper covers intact. If they have been tied with thread (no pins used), it is amazing how long the contents will remain sterile.

The sulphate of aluminum paste makes one of the nicest lubricants for putting on gloves or for examination purposes. It may be sterilized, and many surgeons use it in preference to any cream. Its advantages are well known. Dr. R. H. M. Dawbarn wrote about its use in general surgery some years ago. It is enough for me to say that this paste completes the advantages of an obstetrical outfit which will, at a comparatively low cost (about $5.00), give all the protection that most expensive supplies may do.

Some years ago I found that soaps interfered with complete sterility in skin cleansing and that green soap in its usual condition was probably the least sterile of soaps; therefore I tried to eliminate soap from my technic and finally produced a powder from silicate of magnesia, washing soda, and powdered pumice-stone. This would stand baking for hours. In fact, the container melted or burned before any great change took place in the contents. It would turn a little yellow and just below dull red heat would char. Washing soda loses its water of crystallization somewhere about the boiling-point, but that fact did not seem to affect the powder or its cleansing powers to any noticeable extent.

The preparation of this powder with a mortar and pestle is a tremendous job, and Mr. Arthur Brown, who has a factory and power at his command, has been making it for me. He calls it Surgal, whatever that may mean, but I understand it is necessary to give it some name to distinguish it in the factory; some of the employees call it Zip from the rapidity with which it cleans off grease and dirt. It will clean off vaselin or oil or any substance difficult to remove from the hands. It will clean instruments or paint, and one or my patients tells me that her cook cleaned a rusty kitchen hot-water boiler in a very

satisfactory manner by its use. Its alkalinity is about one-quarter that of good green soap, and it is so much the less irritating. I always have it in my kit, though sometimes the patient buys it.

To cleanse the hands, wash them with Surgal; rubbing them together is better than using a nail-brush. Work the chlorinated lime to a cream on finger-nails and palms of hands (never on the backs). Then work the cream all over hands and under finger-nails in the usual way. Finally wash all off, holding the hands in a basin containing a solution of one heaping teaspoonful of aluminum sulph. to the quart of water and boiled. This has one advantage that might be mentioned, that is, the solution makes the hands dry—it diminishes the perspiration.

If the patient is to be really safe, do not examine her without rendering the vulva antiseptic. It is not enough to have the hand protected by a sterile glove—that will not protect the vagina from germs carried in from the vulva. If examination cannot be dispensed with, then smear your finger with the chlorinated lime cream and do not wash it off. If the lime has been thoroughly rubbed and slacked on your hands examination contact with the vagina is not likely to cause any pain or soreness, and such contact is made with a germicidal finger that leaves an antiseptic track. Conditions may be imagined when this precaution would protect both accoucheur and patient.

An important factor is the condition and care of the patient's feet; this is well known to orthopedic surgeons and usually entirely overlooked by obstetricians, yet much of the damage which appears long after parturition must be attributed to weak ankles or chronic sprain or a broken-down arch or some similar foot abnormality. Enteroptosis, gastric atonia, floating kidney, spinal and abdominal pains, myalgias and neuralgias are a few of the things made worse if not absolutely caused by the constant jarring which results from decreased or lost foot elasticity. I am quite sure that results are very much better if the patient conserves the elasticity of her abdominal muscles by a proper bandage worn from morning till bedtime through the whole carrying period and if her feet ligaments are protected from undue stretching by adhesive-plaster strapping.

Examination of the feet will show a large number of women so damaged by the shoemaker that with the addition of weight (twenty-two pounds average) common to pregnancy, the amount of exercise necessary to maintain good health must be omitted—

the pain either being so great that walking is torture or the foot has been so damaged that local pain is no longer felt and a painless flat foot is shaking and jarring all the abdominal contents and causing all the organs to swing and strain on their suspensory ligaments, which stretch to a remarkable extent. Sometimes the combined loss of foot and abdominal wall in elasticity permits a hernia of the whole abdominal contents. In one instance (my worst, I'll admit) the abdominal wall had its anterior margin outside the whole length of an imaginary line from the ensiform to the patella while the patient was in a sitting posture. Her statement of the case was, "her liver was in her lap."

The foot supports of the shops are of little use; in fact, I fear they often relieve pain, but permit the damage to progress with masked symptoms. A little ingenuity will enable anyone to cure the condition by the means of adhesive-plaster strips properly applied until the ligaments regain their elasticity. Meanwhile the patient should never stand still, but when standing should slowly and constantly rise and fall on the toes (this need not be evident to bystanders); and she should never wear shoes that force the great toe outward at its distal extremity and consequently inward at its proximal end. If a foot has a bunion it presents strong presumptive evidence of too short a shoe or too short a stocking or of both combined. Further information may be found in text-books on orthopedic surgery.

Abdominal aches will usually yield to rectal medication. For instance, one gram (15 grains) of salicylate of soda in 125 c.c. (4 ounces) of normal salt solution. Of course, I refer to varied and obscure pains not dependent on an inflammation, but causing discomfort, worry and mental depression; but I must admit that I have seen on the service of the surgeon-in-chief of the Red Cross Hospital such abdominal cases as appendectomies, gastro-enterostomies and removal of pyosalpinges brought to complete recovery without recourse to any opiate or any other method of relieving pain save the above-mentioned rectal medication, which always gave the greatest comfort whenever it was administered.

As to catharsis and intestinal fermentation, my rule is simple. If there is no kidney lesion evidenced by urinalysis, I give a tea made from "buckthorn bark" cut in small pieces; rhamnus frangulæ cortex conscisæ is the name. The dose is one teaspoonful, a tumblerful of water, and the whole boiled for five minutes, strained through cheesecloth and served hot or cold and with or

without sugar and milk. It should act in about eight or ten hours after exhibition, and if taken at bedtime does not interfere with sleep, but shows its effects after breakfast. Should it not act in twelve hours, the dose should be repeated. Where obstinate constipation is the body habit, I usually order the tea at 10 A. M. and 10 P. M., directing the omission of the morning cup when catharsis becomes too ample, but continuing the evening dose throughout the entire pregnancy. Many druggists have extolled the virtues of the syrup and the fluid extract: their use has always been followed by disappointment. The tea has all the advantages of cascara and its taste is rather agreeable, but the syrup and fluid extract seem to be quite inert.

If there be any kidney complication, potassæ bitartras in heaping teaspoonful doses in a tumblerful of lemonade is very efficient, and may be given once or twice daily as required. Whatever protection cathartics may afford will be found in these two simple remedies. I have of course used all sorts of other medicines, but so far have returned to these with added confidence after each departure. In action they are not severe, they are easily obtained, they are easily carried, they are not liquid, they will not stain your satchel if spilled and they are efficient and cheap. If a patient is sent away to the country, for instance, with a large bottle of cascara in a trunk filled with summer dresses, and the bottle is broken by any mischance, the combination is not happy.

Finally, I believe that acute dilatation of the stomach is responsible for sudden death in pregnant women; to pursue this subject would carry us far afield, but Dr. Robert Kemp is at work experimenting with artificial dilatation and its results in nonpregnant persons, and I am looking forward with interest to his paper. Theoretically, in a pregnant woman the sudden expansion of the stomach between an immovable uterus and a partly movable heart may be imagined. I can only say that I have seen two sudden deaths (eight years apart) which I cannot attribute to anything else, and at Dr. Kemp's suggestion I am now washing out all painful stomachs and carry a stomach-tube as part of my armamentarium for use at the first symptom of cardioventral disturbance.

After an interval of quite characteric pressure symptoms, varying from one to three hours, the tympanites becomes very marked, the patient gasps and gives up her life. If the patient has not been stripped and the abdomen examined the

accoucheur may be mortified and regretful. The whole matter may be summed up thus: "If a pregnant woman has a dilated stomach with tension, pass the stomach-tube too early, for when the pressure effects show on the pulse at the wrist it will be too late. Never leave a tympanitic abdomen until the stomach-tube has been passed and there is a certainty that the stomach is not distended, for when death does occur it takes place with speed and without warning other than the symptoms of a "little indigestion."

SOME UNUSUAL RESULTS FOLLOWING CHOLECYSTOTOMY.

BY

E. W. HEDGES, M. D.,

Plainfield.

On March 4 of the present year I was called to see Mrs. M., aged fifty-one, married, mother of four children, the youngest thirteen years. Her father had been an inveterate sufferer from asthma which did not develop, however, till after her birth. He died of cirrhosis of the liver. Her mother died of cancer beginning in the breast and showing later in the orbit.

At the age of ten years, Mrs. M. began to suffer from asthma, the attacks following any exertion, especially running. Several years ago she had a severe attack of epigastric pain lasting for twenty-four hours followed by tenderness for a week and great exhaustion. There were two more attacks less severe than the first during the next four years. Three years ago she had a very hard seizure and has been tender over the epigastrium ever since.

Indigestion began to annoy her after her first attack of pain seven years ago. This condition has grown steadily worse. She has been more and more annoyed by flatulence, no sharp pains resulting, but general discomfort. The most restricted diet made no difference and all medication was ineffectual. Food was frequently noticed in the stools entirely undigested. Her weight fell from 185 pounds five years ago to ninety-five pounds, most of the loss occurring in the last two or three years. She suffered mostly, however, from her asthma. Everything she ate fermented and this fulness caused shortness of breath and asthmatic breathing that kept her from all exertion in the day time and precluded sleep at night save in short naps. She coughed a good deal and raised enormous amounts of sputum, but the microscope failed to show any tubercle bacilli. There was no fever at any time. For the past two years she had been unable to smell or taste.

When I first saw her, she was confined to her bed by weakness; she was horribly emaciated; was suffering from constant bronchial asthma and raising large amounts of sputum. She nearly

starved herself because food aggravated her symptoms. She had pain in the epigastrium and the abdomen was greatly distended with gas. The pain ran across the abdomen and did not radiate up or down. Her pulse was feeble and ran 115 to 120; examination of urine showed faint trace of albumin and several hyaline casts. There was marked tenderness over the gall-bladder and rigidity of right rectus; no discoverable enlargement of gall-bladder; slight nausea but no vomiting.

On March 24, I opened over the gall-bladder and found a slightly distended organ with gray, thickened walls. About an ounce of pus was drawn out with the aspirator. Upon opening the bladder over two hundred gallstones were removed, ranging in size from a hazel-nut to a bird-shot. The gall-bladder was drained in the usual manner without stitching it to the abdominal wall. No bile flowed through the tube for three days; then it came freely, and the sinus closed in a little over three weeks

The shock of the operation was considerable owing to the patient's weakened condition. The temperature by rectum reached 103 and the pulse was 150 two days after the operation. Twenty-four hours after ether there was four per cent. albumin by centrifuge and an abundance of hyaline, epithelial, blood, and granular casts. Next day the albumin fell to one-half per cent., and soon only a faint trace remained. There was delirium for a week and the patient had no recollection of what she said or did in that time. After this, improvement was rapid, however. Patient began to eat and without any distress; natural sleep came to her; the pain of breathing was gone; her smell and taste came back; life that had seemed hopeless and miserable looked bright again; and, to use her own enthusiastic expression, she felt as though she were "born again."

At the present writing, six weeks after the operation, she can eat anything and everything; can walk a mile without fatigue; her pulse has fallen to seventy-six, she has almost no asthma, a diminishing amount all the time; sleeps through the night without waking once, whereas before the operation, her naps seldom exceeded fifteen minutes; and is gaining rapidly in flesh and strength.

In my judgment the case is worthy of note because of three rather unusual effects of gallstones—namely, loss of smell, loss of taste and persistent asthma; and the disappearance of these symptoms following the removal of the stones.

ACUTE GASTRIC AND DUODENAL DILATATION TREATED BY GASTROJEJUNOSTOMY WITH RECOVERY.

BY

GASTON TORRANCE, M. D.,

Birmingham.

Byron Robinson's case was probably the first on which a gastroenterostomy was done for acute dilatation of the stomach. This operation was done in 1895 on a very much emaciated woman whose stomach was so much dilated as to sag down into the true pelvis; she made a satisfactory recovery and was reported well in 1907—twelve years after operation.

Kehr reported an unsuccessful case in 1899. Mayo-Robson suggested gastroenterostomy in 1900. Korte reported a fatal case in 1904. Remond's case also had a fatal termination. Tschudy in 1905 did an anterior gastroenterostomy and relieved the dilatation but his patient died later of pneumonia. Heile reported a case in 1907 that recovered after a posterior gastrojejunostomy. Sixteen days previous to this time he had resected the pylorus for cancer and had sutured the duodenum to the resected portion of the stomach. At the second operation there was no obstruction at this point and no dilatation of the duodenum.

The following case was referred to my service at the Hillman Hospital by Dr. E. H. Sholl, of Birmingham, on May 18, 1908. B. F., a colored female twenty-two years of age, widow; family history negative. She had pneumonia eight years ago; her general health has always been good; menstruation began at twelve years of age; was always regular and normal; has never been pregnant and as a consequence has no relaxed condition of the abdominal walls.

Two months ago she began to have pain and nausea after eating—some pain in the region of the umbilicus but most marked in the epigastrium to the left of the midline. She presses her hand on this point when walking. Appetite poor; has vomited occasionally. Pain begins a few minutes after

eating and soon becomes more marked. Has been troubled with gas distention and acid eructations, relieved some by taking soda. She has had some palpitation and pain around her heart. Has been in bed for four weeks and has vomited almost daily; has vomited blood; has had tarry stools; very constipated. Has vomited incessantly for two weeks almost as soon as any food is ingested; this contains considerable bright blood at times.

There is marked pain and tenderness on the left side near the tip of the ninth rib; left rectus quite rigid; the stomach apparently not much dilated. She complains of pain under the right shoulder and over the eighth and ninth ribs to the right of the spinal column. For the past few days has been vomiting large quantities of dark greenish fluid. She had been in the hospital a week before consenting to operation and in the meantime has been taking an alkaline treatment without any improvement in her condition.

On May 25, I opened the abdomen through the right rectus muscle and found the duodenum dilated to nearly three times the size of the jejunum below where it is crossed by the mesentery; the stomach was somewhat dilated but not in proportion to the duodenum. I found an indurated ulcer about the size of a silver quarter on the posterior surface of the stomach near the greater curvature about three inches from the pylorus. I did Mayo's no-loop gastrojejunostomy, using Moynihan's clamps and linen sutures for both layers. She left the table in good condition.

On account of the duodenal condition I decided to only elevate the head of the bed about eighteen inches. She was given nutrient and saline enemas and strychnine by hypodermic. She continued to vomit some dark fluid. Two days after operation she was given sterile water and orange juice by mouth. Four days after the operation I decided to put her on a bed rest to see if this would relieve the vomiting, it seemed to make her condition worse; she continued to vomit large quantities of dark fluid at intervals of a few hours (probably the accumulation in the duodenum).

The bed rest and all elevation was removed and the foot of the bed elevated, she was kept on her side and her stomach washed out once daily for three successive days. At the end of two weeks all vomiting had disappeared and she was taking liquid diet and in a few days was out of bed walking about the ward. She became considerably emaciated but quickly regained her

flesh and when discharged, a month after operation she seemed to be perfectly well and was taking a fairly liberal diet. When seen four months after operation she had gained twenty or twenty-five pounds and said she was eating anything she wished and had not had any digestive trouble since leaving the hospital.

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OBITUARY MEMOIR

OF

JOEL W. HYDE, Brooklyn, N. Y.

BY

WALTER B. CHASE, M. D.

Dr. Joel Wilbur Hyde, the subject of this memoir, was born at Westbrook, Conn., March 20, 1839, and died at his home, 215 Schermerhorn Street, September 22, 1897. He was a direct descendant of William Hyde, who came from England in 1630 and settled at Newtown, Mass., and later at Saybrook, Conn. His grandfather, Joel, was a soldier in the war of the Revolution. He was the son of Rev. William A. Hyde and Martha Sackett Hyde, of Westbrook, Conn. Dr. Hyde was fitted for college at Dudley Institute, Northampton, Mass., and entered Yale College in 1857, subsequently graduating from Yale Medical School. He practised for a short time at Greenwick, Conn., but the continuance of the Civil War led him to abandon his practice, and in 1863 he entered the Federal army as second lieutenant of Company A, 29th Conn. Infantry.

In April, 1864, he was appointed Acting Assistant Inspector-General of the staff of Brevet Major-General Saxton in South Carolina. In July, 1864, his regiment was ordered to Petersburg, and he was appointed Acting Assistant Inspector-General of the First Brigade, Third Division, 10th Army Corps, which position he held until October, 1864, and was then made surgeon in his own regiment, the 29th Conn. Volunteers. He received orders from Washington to establish the Brigade Hospital at Point Lookout, Md., and he was personally in charge of this hospital until July, 1865, when he rejoined his regiment then attached to Sheridan's army of the Gulf. He participated in numerous engagements, notably John's Island expedition, South Carolina, Bermuda Hundred, Weldon Railroad, Darbytown Road, and the surrender

of Richmond. Dr. Hyde was honorably mustered out of service in November, 1865. The following year he established himself in Brooklyn, where he rapidly became prominent in the practice of his profession, devoting himself especially to obstetrics and diseases of women.

From 1867 to 1874 he was the attending physician to the Brooklyn City Orphan Asylum. In 1881 he was made consulting physician and secretary of the council of the Long Island College Hospital, remaining a member of the council until his death, having previously been made president of the council. He was also consulting gynecologist of the Bushwick Central Hospital. In 1883 he was made chief of the department of obstetrics in St. Mary's Hospital. He was one of the oldest of the Kings County Medical Society, and in 1891 president of the Brooklyn Gynecological Society. He was also a member of the Medical Society of the State of New York, the Associated Physicians of Long Island, the American Association of Obstetricians and Gynecologists, and the Brooklyn Pathological Society. From 1866 to 1891 he was medical referee and chief examiner of the Ætna Life Insurance Company of Hartford, and also of the National Life Insurance Company of Vermont. From 1881 to 1887 he was Brigade Surgeon, National Guards of the State of New York, serving on the staff of General E. A. Molineux and later on General Brownelles's staff. He was member of the military order of the Loyal Legion of United States and of the Society of the Army of the Potomac.

He leaves a widow, Mary Elizabeth, daughter of the late John Richardson, of New Haven; two daughters, Alice E. and Edith M., and two sons, Frederick S. and Clarence R. Hyde. The former, Mr. Frederick S. Hyde, is well known in scientific circles as an eminent analytical chemist. His younger son, Dr. Clarence R. Hyde, is a physician of standing and prominence in this city, is one of the attending surgeons of the Long Island Hospital, a member of the Brooklyn Gynecological and other societies.

Dr. Hyde's personality had in it a charm and attraction which few possess and which words cannot portray. His was the well-rounded outline of grace and beauty; erect, dignified, of pleasing address, and commanding presence, he possessed the attributes of a gentleman of the old school. Simple, gracious, inspiring, the elements of his manhood were perfectly mixed. He was born to captivate and command. No one ever knew a truer friend.

His faithfulness was a cardinal attribute of his nature. It was the combination of these qualities which endeared him not more to his friends than to a large and select clientele. In the last few years of his life impaired health and inability to meet the demands of his professional life was to him a source of bitter disappointment, but with a stability of character and a heroism born of Puritan ancestry he yielded with Christian fortitude to that physical impairment which forbade active labor. It was the writer's great privilege to have been on terms of closest intimacy with this lovable man, and with a wide and appreciative constituency his memory will be blessed.

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